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COMPUTERWORLD

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The DP Job Market

One Study Sees Prospects Flourishing...

By Paul Gillin
CW Staff

NORTHFIELD, Ill. — Despite the sluggishness in DP hiring caused by last year's recession, the data processing job market will flourish in coming years, the "1983 Computer Salary Survey" released this month by Source EDP Personnel Services, Inc. here predicted.

However, DP salaries barely held the line with inflation in 1982, a marked departure from the meteoric rise they enjoyed during the late '70s, a comparison of Source EDP salary figures shows.

For example, the median salary for an entry-level programmer rose to $20,000 in 1982 from $19,200 the previous year, an increase of 4%. Experienced data base specialists, who topped the salary list for nonmanagers, also saw a 4% median rise.

In the managerial ranks, operations managers at small installations saw their median income rise less than 1%, from $26,900 to $27,100, the survey revealed. Even for directors of large in-

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Second Hints Tough Times to Continue

By Susan Blakeney
CW Staff

NEW YORK — For entry-level programmers, 1982 was the year when job hunting changed from a creative challenge to an uphill battle. Experienced programmers who were job shopping also had their share of difficulties as they faced fewer opportunities, stiffer competition and lower salary increases.

But for DP executives or managers looking to hire, 1982 was the first year in a long time that they could afford the luxury of hiring in batch rather than real time, compare qualified candidates and consider such things as communication skills, promotability and personal chemistry.

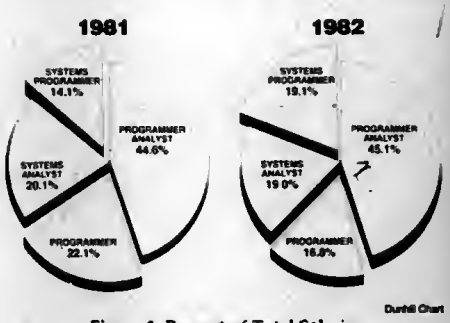

Figure 1: Percent of Total Salaries

Those were the findings of a recent DP labor study from Dunhill Personnel System, Inc., a major national recruitment firm based here. The research was conducted under the direction of Rick Kean, who oversees Dunhill's 248 DP personnel consultants located across the U.S.

According to the sur-

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Where the Surveys Disagree, Concur

By Paul Gillin
CW Staff

The employment outlook for the DP industry of the 1980s is either poised for takeoff or racked with uncertainty, depending upon which recruiter you trust.

The "1983 Computer Salary Survey," published by Source EDP Personnel Services, Inc., sees demand increasing for DP professionals in virtually every area. Opportunities will be widespread in the areas of commercial, engineering and systems software programming, data base design and telecommunications, the study maintains.

But a similar survey made by Dunhill Personnel System, Inc. called 1982 a tough year for DP job seekers and hinted that 1983 may not be much better. According to the Dunhill study, experienced programmers discovered that competition for jobs had increased dramatically as DP growth slowed to a crawl. DP managers found themselves with fewer jobs to fill and an ever-increasing pool of applicants from which

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Mathematica Updates Its Ramis II DBMS, Unleashes CICS Rival

By Paul Gillin
CW Staff

PRINCETON, N.J. — Mathematica Products Group, Inc, last week introduced enhancements for its Ramis II data base management system.

At the same time, the vendor unveiled Atlas, a data communications monitor designed to compete with IBM's CICS. The monitor reportedly manages the execution of application programs through operating system multitasking.

Ramis II runs on IBM and plug-compatible systems in VM, MVS, OS/VS1 and DOS/VSE environments. Release 83.1 (the first release of Ramis in 1983) includes separately priced screen formatting and relational model tools and reporting extensions which are incorporated into the basic package.

The updated Ramis includes a Formatted Screen Manager that allows more flexibility in the use of Ramis II for on-line application development, Mathematica said. FSM can be used for the design and testing of screens and for data entry.

Screens are defined by first painting layouts and then specifying field attributes via menus. Data maintenance is carried out in conjunction with Ramis II Records Management, ultimately allowing users to validate and process transactions and to add, update and delete records.

Also part of the new Ramis release is Relate, a tool for dynamically combining data from multiple sources including Isam, Vsam and Qsam files, IMS, DL/1, Cul-

(Continued on Page 12)

BOCs Take Wraps Off Net Services

By Phil Hirsch
CW Washington Bureau

ORLANDO, Fla. — The first two data network services the Bell operating companies will offer after they are divested by AT&T were officially unveiled here last week at a seminar sponsored by the International Communications Association (ICA). They are a local-area data transport service and a 56K bit/sec circuit-switched service.

The local-area data transport service will support simultaneous voice and data transmission over the Bell operating companies' existing local-loop network between the user's site and a backbone packet-switching network, according to Robert Polsen, staff member of a central organization recently

(Continued on Page 14)

DP Shop Reshapes Itself — In Only Four Months

By Lois Paul
CW Staff

FRAMINGHAM, Mass. — The move toward an integrated manufacturing system started a chain of events at the Dennison Manufacturing Co. here that led to a hardware conversion, the installation of a new operating system, the addition of a new data base management system and the addition of a manufacturing software package — all in a four-month period.

In late October, the 100-year-old manufacturer of office supplies for the home, office, schools and industry got the nod from corporate management to install new manufacturing system software. In the process, it began a major project — scheduled for completion next month — to update its core data processing system, explained Gary Lee Kelley, management information systems education coordinator for Dennison.

To install an integrated manufacturing system, Dennison needed more computing horsepower. That pointed the DOS shop to-

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But Award Must Be Reconsidered

MCI vs. AT&T Verdict Upheld

CHICAGO — AT&T's multiple violations of the Sherman Antitrust Act between 1969 and 1975 were confirmed here last week when the U.S. Circuit Court of Appeals upheld a federal district court verdict in a case brought by AT&T's chief competitor, MCI Communications Corp.

However, the lower court was told to reconsider its $1.8 billion treble damage award to MCI, the largest in history.

MCI's suit, filed in 1974, was decided initially in 1980, when the district court concluded that AT&T had committed 10 of the 15 violations charged by MCI. Eight of those 10 charges were upheld by the court.

A complaint that AT&T's "Hi-Lo" private-line tariff included predatory prices was rejected, for example, but the appeals court ruled that AT&T, by not letting MCI interconnect with the telephone network, had violated the Sherman Act and that the phone company had failed to comply with specific court and Federal Communications Commission orders requiring it to interconnect.

One month before last week's appeals court decision here, a federal district court in Washington, D.C., after considering similar charges filed by Southern Pacific Communications Co., found that AT&T had not violated the Sherman Act. About 50 antitrust cases are now pending against the phone company.

The big question at the moment is how much AT&T will be fined. MCI chief William McGowan said that since AT&T eventually provided the interconnections that led to the suit, it shouldn't be difficult to determine how much revenue the company lost while the suit was pending.

The day before the appeals court decision, MCI announced record earnings and revenue; during the first nine months of its current fiscal year, revenue totaled $741.8 million, compared with $341.6 million for the year-earlier period.

AT&T said it was "pleased" with the decision because "the heart of the case, the pricing issue, has been thrown out. What remain are minor matters."

'Apple Bill' Reintroduced For Vendor Tax Deductions

WASHINGTON, D.C. — The so-called "Apple Bill," legislation to provide a tax deduction for firms donating computers to elementary and secondary schools, has been reintroduced in Congress. Its sponsor has pledged a concerted effort to enact it.

Rep. Pete Stark (D-Calif.), who reintroduced the Computer Contribution Act Jan. 6, promised he and other congressional supporters of the bill will make "a major new effort" to get it through the new Congress. The legislation, partly the brainchild of Apple Compoter, Inc. Chairman Steve Jobs, easily won approval in the House of Representatives last year, but was held up in the Senate, where it was attacked as a special interest measure aimed at benefiting a select few computer manufacturers.

When the bill was first introduced in early 1982, Jobs said his firm was prepared to donate more than $200 million worth of computer equipment to 75,000 elementary and secondary schools if the increased tax deduction was granted. The bill would provide firms with a special tax deduction equal to the cost of manufacturing plus one-half the usual markup of computer equipment donated during one year, 1984.

The deduction is the same as that now available for scientific equipment donations to colleges.

Corrections

The final paragraphs of "Firm Expands System, Solves Data Entry Woes" in the November Special Report [CW, Nov. 29] were inadvertently omitted. They noted that O.R. Systems, Inc. eventually decided to buy ECS 4000 series terminals manufactured by ECS Microsystems, Inc. of San Jose, Calif.

Prices for the Bits family of software modules offered by Boeing Computer Services Co. [CW, Dec. 6] start at $300.

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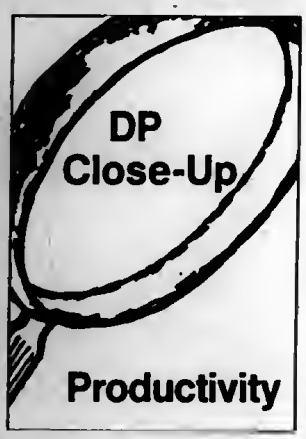
Ways to Measure Productivity Still Inadequate

By Paul Gillin
CW Staff

It has been more than three years since productivity first became a favorite and much-defined data processing buzzword, but no one has yet come up with an adequate method to measure it, according to DP managers and analysts interviewed recently by *Computerworld*.

Moreover, the problem has been heightened in recent years by the infusion of such software productivity aids as high-level and nonprocedural languages and application generators. These labor-saving tools have made obsolete those measurement techniques that rely on counting lines of input or output, experts said.

"There's no such thing as an effective [productivity measurement] system. I can't even dredge up a suggestion," said Peter Lamasney, president of Smallframe Systems, Inc., a San Francisco systems house.



No Reasonable Technique

"We don't have a technique we accept as even reasonable," said Richard Streebel, technical consultant in financial services at Associates Bancorp, Inc. in South Bend, Ind. "The closest measure we've got is user satisfaction."

In the past, one popular productivity measure involved counting lines of code. However, with high-level languages cutting those figures by 75% to 90% in some cases, hard-number measurements can skew averages toward the programmer who writes a great many lines of code.

At the other extreme, evaluation techniques that rely upon the volume of programs produced may favor the programmer who writes many simple routines using productivity aids. "We've got some small programs that are absolute bears and large programs that we can give to trainees," said William Bell, department director for systems development for the commonwealth of Virginia's Department of Management Analysis and Systems Development.

In the meantime, it seems there are as many forms of productivity measurement as there are DP shops. Small operations favor informal techniques, while large shops often use complex and sophisticated mathematical tools. DP managers interviewed admitted that their methods of evaluating programmer productivity are homegrown in general and merely adequate at best.

"It's something we're all very concerned about and working on," said Larry Crosman, vice-president of systems and programming for John Hancock Mutual Life Insurance Co. in Boston.

No Definitive Method

"We don't have a really definitive method. We look at a variety of numerical and objective factors, including scheduling, use of tools, comments from users and ease of maintenance," Crossman said.

In order to use an informal evaluation system for his crew of 27 programmers, Jim Hodges of Merrell Dow Pharmaceuticals in Houston breaks projects into segments, sets deadlines for each and measures success in meeting the schedules. Although initially awkward, the method has proven reliable even after productivity enhancements were installed.

"We've been working on it for the last year," Hodges said. "Our estimates weren't that good at first, but they've gotten better, and we believe the end result is a better measure for productivity. This method has also helped us to decide whether to use productivity aids."

After evaluating line-of-code and other quantitative measurements, Bell's 112-member department developed T^2, an algorithm that compares total resources consumed by a project against an assumed average.

"Our method concentrates not on output units as much as upon measuring actual expenditures against budgeted expenditures," he said. "We haven't found anything we prefer over T^2."

But Bell's shop encountered problems recently when several productivity aids were installed, including DMS from IBM, Information Builders, Inc.'s Focus and Management & Computer Services, Inc.'s Promacs. "T^2 pretty much goes out the window when we start dealing with productivity tools," Bell said. "We're now using T^2 and a lot of judgment."

Authorities still debate whether productivity measurements are necessary or accurate without similar indicators at other levels of the process. "The whole concern about programmer productivity is misplaced," Lamasney said. "Analysts take all kinds of shortcuts. Therefore, it's falling on the programmers to make key decisions. Recycling and editing is being reported as programming."

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National Semi Stockholders Say Company Overstated Earnings

By Bill Laberis
CW Staff

PHILADELPHIA — National Semiconductor Corp. has been hit with a class action suit alleging, among other things, that the company intentionally overstated pretax earnings by $32 million over a four-year period.

The suit was filed in U.S. District Court here on behalf of company stockholders who, in three separate allegations, charged that certain company actions from 1977 through 1981 falsely inflated the value of National Semi's stock. The stock's value eventually fell, causing some investors to lose heavily, the plaintiffs will try to prove.

A spokesman for National Semi said there "is absolutely no merit in the suit." His company will file a complete reply to the charges by the end of January, he added.

The stockholders' suit seeks damages commensurate with the aberrations in National Semi's stock value caused by the company's alleged wrongdoings, according to a spokeswoman for Greenfield & Chimicles, the Bala Cynwyd, Pa., law firm handling the plaintiff's case. These damages are expected to be substantial.

Stock market analysts and other securities specialists will reportedly be called to testify in assessing the exact impact National Semi's alleged wrongdoings had on the stock's value, the spokeswoman said.

In the suit, stockholders contend that National Semi overstated revenues and pretax earnings in each year from 1977 to 1980. They claim the company overstated as much as $12 million in pretax income in 1980 alone, while overstating revenues by $16.4 million. National Semi accomplished this in part, the suit holds, by including sales to some distributors as complete sales when certain of the sales were not complete.

The second of three allegations charges that National Semi defrauded the federal government in the late 1970s by supplying the military with substandard microcircuits for weaponry and communications systems, thus causing the company to be dropped from certain government-qualified parts supplier lists.

Another result of the company's actions vis-a-vis its military contracts is that it is now the subject of a federal grand jury investigation, the suit maintains.

The third allegation charges that National Semi was involved in the theft of trade secrets from IBM. This charge is directly related to the suit filed by IBM that implicated National Semi in an alleged Japanese plot to steal trade documents [CW, Sept. 27, 1981]. Hitachi Ltd., the central defendant, and National Advanced Systems, Inc., a wholly owned subsidiary of National Semi, were also named in that suit. All three defendants in this case have denied IBM's charges.

Complaints and pleadings in the class action suit against National Semi must now be heard before a U.S. District Court judge, who will first decide whether the case should be heard as a class action suit or as a suit brought by individuals.

One of First 'Omnicalc' Users

Mainframe Shop Ventures Into Micro Territory

By Lois Paul
CW Staff

HUNTINGTON BEACH, Calif. — How do you keep your DP managers from having to use paper and pencil to figure out their budgets, short of bringing in 20 microcomputers that support electronic spreadsheet packages?

This was the problem faced by Mark See, manager of technical support and operations for Wyle Data Services, an IBM mainframe-oriented shop with a 500-terminal CICS network. See's solution was to arrange for his firm to become one of the first users of Omnicalc, an electronic spreadsheet package designed for IBM and plug-compatible CICS-based mainframes. Omnicalc was introduced last month by Tower Systems, Inc. of Irvine, Calif. [CW, Dec. 20].

"We were trying to look for new systems for users and programmers to help in day-to-day operations," See said. One of the goals was to obtain help in doing "rudimentary exercises such as budget analysis and forecasting. I wouldn't be surprised if I spent four to six man-weeks last year doing budget preparation, and most of it was just erasing and changing numbers.

"What happens frequently in DP is that we don't take advantage of the kind of technology that we try to provide for our users," he said. He recalled that because of the economic situation last year, he was forced to revise his budget about eight times. "Each time I had to pull out my 13-column accounting pad. It would take me a week of erasing and recalculating to come up with a new budget," he recalled.

See's Alternatives

See has used Visicorp's Visicalc spreadsheet software on a microcomputer, but did not want to recommend this product on a wholesale basis to meet his firm's needs. "That didn't seem to be an alternative because we have an IBM 3033 out there, a $4 million machine, and [I would have had to ask my firm] to buy 20 more computers. I wanted to take advantage of the equipment and expenses our company has already incurred."

Another reason he decided to go with a large mainframe-based spreadsheet package was the problems that remain when users of a microcomputer attempt to exchange data with a host system. "The technology just isn't there," he said. "We have a huge DL/I data base and 8M bytes of disk space, none of which we can easily get to and from the mainframe." His feeling was that if Omnicalc was developed correctly, it would evolve to a point that interfaces to host systems would be easily achieved with future releases of the product.

Currently there is only one IBM Personal Computer at Wyle Data Services, and its user has had to key in manually any data from the micro that he wants to manipulate on the mainframe. "You want to be always in the position to try and share data," See explained. "Omnicalc has passwords so people can't get at the work you are doing. Yet if you want to, since everyone is on a common network of CICS, you can instantaneously, automatically have the ability to share information as opposed to trying to mail floppy disks all over the place."

Wyle Data Services, which provides data processing services for Wyle Electronics, has used tape and disk management packages from Tower Systems in the past. See said that it was the relationship with the firm and the good experience with previous products that led him to agree to be a first user of Omnicalc. The firm's CICS made Omnicalc "a natural fit for us," he said. "I could literally, on a day's notice, have 500 people taking advantage of it."

See began "pioneering" the use of Omnicalc at Wyle Data Services two months ago. "I am loading my budget information — all of the software budgets and all of the hardware — on there now and building formats. The other managers are constantly looking over my shoulder, seeing what I am doing, because they have got 13-column sheets they are working on.

"I wanted to get on board with it and get any problems out of the way before I turn it loose," See said, noting that he has not had any problems to date. Omnicalc will be offered first to the management staff in the computer facility, then to all of the firm's executives and business analysts.

Although the software is command- rather than screen-oriented, See does not anticipate any difficulty training users on Omnicalc. He said most of the commands are pretty basic. "I think I can set up a one-hour demonstration and walk thorugh it and then with the documentation they will have no problem," he said.

Tower Systems did not come out to train See on Omnicalc. "I brought it up and read the manual one night while I was watching TV and I'm doing it. It is not that difficult."

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Dennison Reshapes DP Shop in Four Months

(Continued from Page 1)

ward a switch from its current IBM 4341 Group 1 and Group 2 mainframes to an IBM 3033 (see story at right). But to run an IBM 3033 most efficiently, the firm was told it needed the MVS operating system.

The selection of the manufacturing package, the Product and Inventory Optimization System (Pios) from Rath & Strong Systems Products, Inc. of Dallas, prompted another conversion. Pios interfaces directly to Cullinane Database Systems, Inc.'s IDMS data base management system (DBMS), but Dennison was running Cincom Systems, Inc.'s Total and IBM's DL/1 DBMS.

Dennison has six operating divisions that are basically autonomous but supported by a number of core service groups such as Accounting and Personnel. Raw materials are shared by many divisions and certain services, such as purchasing, are handled over all divisions.

So when Dennison — which had been running a largely homegrown manufacturing system — decided it needed new manufacturing software, it began looking for a system that could handle manufacturing operations in a multidivisional mode as well as integrated material requirements planning that could overlap all divisions. The company reviewed a number of packages, including offerings from Comserv Corp., Martin Marietta Data Systems, Inc., Walker Interactive Products and Arista Manufacturing Systems.

The package that seemed to fit the bill most closely was Pios, even though it required the switch to IDMS. "Because of the broad scope of the Rath & Strong package, we deemed it to be worthwhile for us to change our standard for data base systems," according to Dennison's Gary Lee Kelley. Pios handles basic accounting, personnel, scheduling, order inventory, material requirements planning and cost control.

The entire package — hardware, operating system, DBMS and manufacturing software — was rolled into one package for one big conversion that would run about $22 million. Hugh A. McGlinchey, Dennison's manager of administration, research and engineering, said, "I am always impressed with the resilience of human beings. In Technical Services, people were faced with both a new DBMS and a new operating system in a few weeks."

The firm decided to handle the bulk of the conversion with its in-house staff and not resort to outside help except for vendor support. "Having been on the other side of things, there was no way I wanted to go back to our users and say, 'We have the greatest people in the world working on it, but they will come back in a week. Be patient.' Plus, my own people spilled a lot of blood putting this in. It became a very personal cause to us," McGlinchey recalled.

The only increase in staffing has occurred in Technical Services, which has grown from a three-person to a five-person group since the conversion.

McGlinchey speculated that Dennison people have spent about 2,140 hours on the conversion. Weekly meetings involved all of the individuals working on the then-current phase of the conversion — which could range from systems specialists to manufacturing people to the people cutting tiles in the floor to install the new equipment.

IBM provided an impressive level of support, McGlinchey said. The MVS operating system was generated through IBM's MVS Express system at the vendor's Dallas Technical Center. "You go down with empty tapes and, based on what you want to do, you generate MVS and take the tapes back to the office," he explained.

Dennison expects to bring up MVS before the end of the month. "We are doing fine-tuning before it will be officially available," McGlinchey said. "We will then bring up the manufacturing package and IDMS in early to mid-February," he added.

Kelley has trained all of Dennison's computer operators on MVS during the past two months. Training on IDMS will take place through the next month. Additional training will be handled on an as-needed basis.

Santa Heard Its Prayers

By Susan Blakeney
CW Staff

FRAMINGHAM, Mass. — Dennison Manufacturing Corp.'s computer system magically appeared this Christmas, and everything in the big blue boxes worked right off the bat.

Not bad for a last-minute request to Santa, considering that corporate management did not give the green light until Oct. 27 to convert from dual IBM 4341 computers to an IBM 3033 system before the start of 1983.

"The six operating divisions of this company are supported by a number of service groups," explained Hugh McGlinchey, manager of administration, research and engineering for the for the multimillion-dollar maker of office supplies. "We sat down over a year ago to figure out how we would be able to plan for future expansion. The MIS [management information systems] department came up with a system plan and we got the green light in October."

The 3033 installation, which included the installation of several IBM 3375 disk drives and VSE Release 3.0 to support the 3375s, is increasing Dennison's computer capacity from 2.13 million instructions per second (Mips) to 4.8 Mips, McGlinchey said. In direct-access storage device capacity, Dennison leapt from 6G to 15.9G bytes.

The company considered converting to a distributed data processing system, but "we decided we're taking a big piece of pie as it is," said Gary Kelley, Dennison's MIS education coordinator. "We were able to more than double our capacity with the 3033 for about the same cost as getting increased disk capacity."

Dennison did not have time to perform parallel processing in its implementation of the 3033 — the new machine no sooner came in the door than the old ones were gone. "They were already sold. We had to get rid of them before Dec. 31," McGlinchey explained.

McGlinchey admitted the timing of the hardware conversion was frenetic — nine weeks from start to finish. The reasons: a combination of an IBM price break, Dennison's budget schedule plus the fact that "we had raised everyone's expectations of the new system, and were afraid if we didn't go ahead right away it would be hard to retain people's interest and motivation," which were needed to support the conversion.

Up came the tile floors and in came the power lines, cables and new cooling system, requiring a seven-day week for many Dennison employees and the movement of lots of bricks and mortar. But the conversion went off without a hitch. "If it had snowed we would have had problems, but even the powers-that-be cooperated," said McGlinchey, referring to the unusually mild winter and the elaborate water-coolant piping that had to be installed on one of Dennison's roofs to cool the 3033.

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Surveys Disagree, Concur

(Continued from Page 1)

to draw.

In contrast with the Source EDP study, which found that "more alternatives are open to commercial programmers and programmer analysts than any other group," respondents to the Dunhill survey showed a 20.8% decrease in hiring for programmers in 1982.

And the Dunhill survey report highlighted a new feature of DP job-hunting that did not make the Source EDP list: DP managers are scrutinizing personality and organizational factors more closely than ever in making hiring decisions. For DPers just entering the market, that means technical expertise and a planned career path are no longer a guaranteed path to success in the DP environment.

On several other points, the surveys agreed:

- The market is growing for professionals who can support data base and data communications technologies.
- Average DP salaries will continue to outpace inflation, but at a slower rate than was found in the previous decade.
- Demand for system programmers is likely to remain hearty — but just how strong is another point of contention. While Source EDP forecasts "strong demand across a broad front" for systems programmers, the Dunhill study found that job market is industry-dependent. Systems programmers in banking and machinery polled big increases in 1982, Dunhill noted, but increases were considerably smaller for systems programmers who worked in business services and insurance.

U.S.A.

1972: SyncSort was used by 2%. 1982: SyncSort was used by 75%.

(We've come a long way, baby!)

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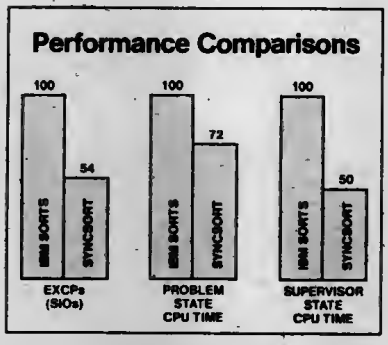
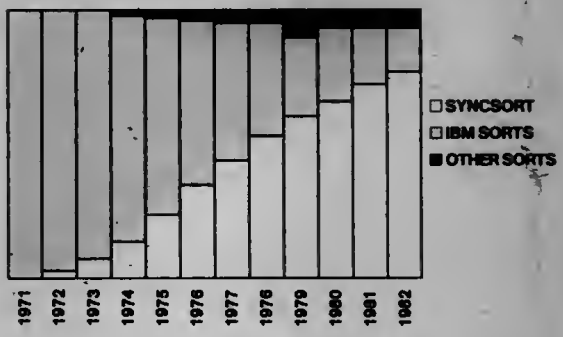


THE FACTS: In a single decade, SyncSort has become the world's most popular independent software program.

In 1972, its first full year of production, SyncSort was used by only 2% of America's data processors. Today, it is the choice of 75% of the nation's major data processors, according to the most recent IDC sort survey. Just how steady this growth has been can be seen from the following charts:



PERCENT OF USERS IN THE U.S.*

Sort Used	1982	1980	1978
SyncSort	75%	69%	54%
IBM	19%	25%	42%
Other	6%	6%	4%

THE REASONS FOR SYNCSORT'S POPULARITY: In the past ten years, SyncSort has pioneered virtually every advance in sorting. Many of these innovations are now patented. As a result of this technological "sort gap," IBM sorts can no longer compete successfully with SyncSort in any of the following areas:

(1) PERFORMANCE: Because they operate more efficiently than IBM sorts, all three versions of SyncSort — OS, DOS and CMS — use fewer computer resources. The charts at left will give you an idea of the magnitude of these savings.

(2) PROGRAMMER PRODUCTIVITY: SyncSort drastically reduces the amount of time programmers have to devote to sorting. Using a combination of SyncSort's advanced features, it is often possible to reduce the amount of time required for simple reports from five programmer days to one.

(3) SERVICE: Our Technical Service specialists are the best in the field. They play a key role in shaping new SyncSort releases. And they handle more than 85% of all requests for sorting advice in less than 24 hours.

To those 6,500 users who made 1972-82 "the SyncSort Decade," our warm thanks. And to those who do not yet use SyncSort, it's never too late to reform your sorting!

*According to IDC's Sixth Annual Survey of Sort Programs Used in IBM OS and OS/VS Environments

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Job Market to Flourish, Source EDP Concludes

(Continued from Page 1)

stallations, salaries went up less than 6%.

The Source EDP survey, based on data drawn from an analysis of 50,000 individual clients, predicted that DP professionals with managerial experience will see increased demand for their skills and upgrades in their levels of responsibility.

For information systems directors in particular, "demand will remain relatively high as intermediate and smaller organizations continue to upgrade."

Information systems directors fared well in the survey's professional compensation data for managers. Source EDP found that the director of a large DP shop earns a median salary of $60,300, with the top 15% bringing home nearly $90,000 annually.

In contrast, the director of a small installation earns a median income of $40,600.

Data base specialists lead the non-managerial ranks in terms of salaries, according to survey findings. A data base specialist with more than four years of experience makes a median income of over $40,000.

Demand for those professionals will increase because of growth in the number of installed data base management systems in coming years, the report predicted. Data base specialists with experience in a major Codasyl or hierarchical data base package, a knowledge of communications or distributed systems and a knowledge of relational data bases are expected to fare best in the job market.

The outlook is also rosy for commercial programmers and programmer/analysts in nearly every area. Those in highest demand will have experience in large operating systems, job control languages, data base management and direct access techniques, remote processing, virtual systems, CRT terminal drivers and data base handlers, according to Source EDP.

While starting salaries currently settle at about $20,000 for entry-level commercial programmers and programmer/analysts, those with more than four years of experience can earn well over $30,000, the survey reported.

However, to make the biggest salaries in nonmanagerial positions, DPers should specialize, the survey indicated. Professionals in the user environment should become familiar with distributed processing, networking and communications. Professionals seeking new opportunities should look to the burgeoning minicomputer and microcomputer markets and to service organizations.

Demand is increasing for engineering/scientific programmers, minicomputer and microcomputer programmers, systems software programmers, data base specialists, telecommunications programmers and electronic DP auditors. Median salaries hover in the $30,000 range for most, with senior analysts and consultants making $56,000 and up in some companies.

Source EDP projected that fast future growth will occur in the fields of computer-aided design and manufacturing. About 50,000 jobs will be created in the robotics industry in the next 15 years, and the demand for computer professionals to design and program the new automation will be intense.

Technical service and systems and programming managers fall in about the same salary range, the survey showed, with the median level varying from $38,000 at small installations to nearly $50,000 at the largest shops.

Of all managers, those in operations earn the least, the survey found. The median figure is $40,500 for those at large installations and just over $27,000 at small shops.

The survey is available free from Source EDP at Suite 227, 2 Northfield Plaza, Northfield, Ill. 60093.

Dunhill Says 1982 Year of Real Changes

(Continued from Page 1)

vey. DP departments enjoyed regular and rapid growth from 1976 to 1981. Systems configurations, budgets, titles, salaries and salary increases got bigger and better every year.

With the recession in 1982, however, DP opportunities simply stopped growing and several major shifts took place in the nature and composition of DP hiring practices. For example, the relative hiring share of the top four titles hired (also measured in total salaries paid) indicates that more hiring is occurring for higher level positions (Figure 1).

Programmer/analysts and systems programmers both gained in relative hiring share in 1982, while systems analysts and programmers both showed losses.

The most dramatic changes in relative demand were for systems programmers, with a 35.5% increase in hiring share in 1982, and for programmers, with a 20.8% decrease.

The reasons for these changes include increasing demands for internal support of data base and data communications and upgrades of operating systems, coupled with a trend toward hiring the functional generalist for application development environments, according to the Dunhill report.

Another change in 1982 compared with 1981 has to do with which industries are doing most of the DP hiring.

In 1981, information-intensive service businesses such as banks, utilities and insurance companies hired approximately half (52.9%) of all DP professionals. In 1982, however, this group claimed the lion's share of DP personnel with 71.1% (Figure 2).

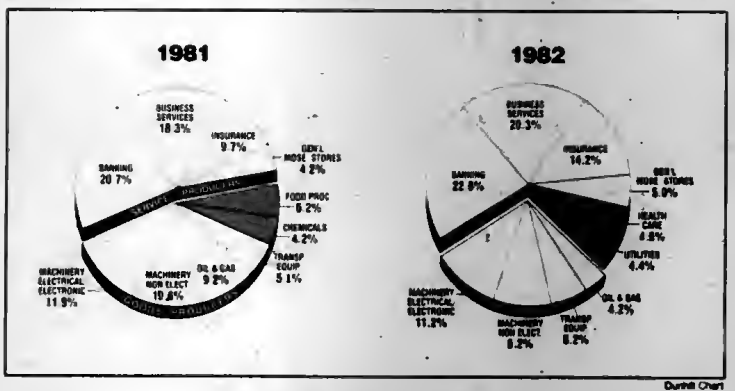

Figure 2: Hiring Action by Industry

Because of rocky economic times, all DP executives and managers involved in Dunhill's industry research admitted to exercising more selectivity in hiring than ever before.

Technical Skill Not Enough

Basic technical skill was no longer enough to land a job. DP employers were in a position to expect more — and get it — from job applicants. Increasingly, as the year 1982 wore on, candidates at all levels were evaluated for problem-solving skills, their ability to get along with others and their "service" attitudes, the study reported. True to the temper of the times, job-hoppers were looked upon with less tolerance, and candidates were chosen for their past successes as well as their future potential.

Furthermore, hiring requirements became increasingly application- and industry-specific in 1982. DP executives often opted for the "plug-compatible" candidate that could be productive right away.

In addition, DP professionals across-the-board exercised much more caution in evaluating career options last year. As the market tightened, DPers began to look for evidence of corporate and departmental stability, Dunhill said.

Wherever possible, DP executives avoided relocation in 1982. The Dunhill report indicated this phenomenon was especially pronounced in the larger metropolitan areas, including Dallas, Chicago, Detroit, Boston, Los Angeles and New York, where the population of potentially qualified candidates was particularly high.

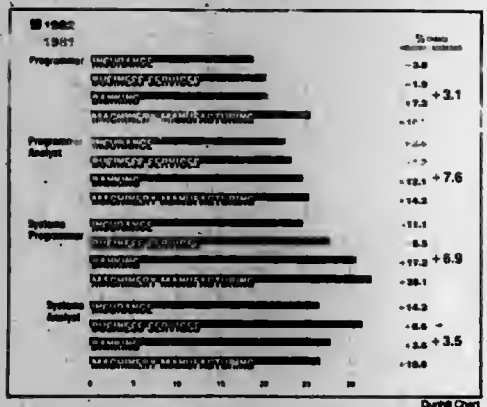

Figure 3: Average Salaries of Computer Professionals Making Job Changes Within Selected Industries

Salary Increases Smaller in '82

NEW YORK — While DP salaries continued to move upward during 1982, average salary increases were much lower than in previous years. Some industries actually paid less for certain positions than they did in 1981, Dunhill Personnel System, Inc. found in its recent study of the DP job market.

Only two title/industry combinations (systems programmers in banking and systems programmers in machinery industries) produced average salary growth rates at anything close to the whopping 20% increases that set the industry reeling as late as mid-1982 (Figure 3).

Five categories that showed decreases were programmers in insurance companies, programmers in business services, systems programmers in insurance, systems programmers in business services and systems analysts in machinery.

Salaries did show an overall increase for all job titles, ranging from 3.1% for programmers on the low end to 7.6% for programmer/analysts on the high end. This range and a composite starting salary growth rate of 5.3% for all titles and industries are representative of the arrested growth rate in the DP industry in 1982.

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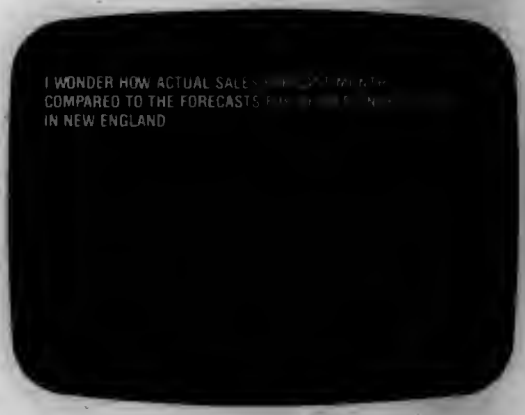

With Intellect,™ all you do is type a simple question—any way you want

Before Intellect,™ you had to use a complicated query language like this

Intellect is the only *true* English-language query system. It enables users to question the computer in everyday, conversational English.

Other query and retrieval systems claim this ability, but prove to be merely English-*like*. They require a thorough knowledge of special syntax, complex query sequences, and rigid formats and codes before a user can retrieve any meaningful data.

Intellect, however, employs the technology of Artificial Intelligence to understand even the complex pronoun references and incomplete sentences that we all use in conversational English. Executives can access data themselves—more easily than ever before—without learning *any* jargon or "computerese." It's so easy to use it doesn't even have a training manual!

All the user has to do is type in a simple question in plain, informal English. Intellect almost instantly translates the request and optimizes the retrieval of data from the database. The answer will appear in seconds.

Executives don't have to wait for information, and the DP department is freed from having to respond to management's requests for reports. Tedious, repetitive report generation becomes a thing of the past.

Intellect isn't just for simple questions. The system can relate information from several files to respond to a query, so that a request doesn't have to be confined to a single file. Users can compare different sets of data with one question, as when comparing actual sales figures with projections. Managers make better decisions with all this information instantly available at their fingertips.

Many non-DP people think it's always been this easy to get information from a computer. That's why they get so frustrated when they discover that they have to learn a complicated formal query language in order to retrieve the data they need. If they have any experience working directly with a computer, they'll be amazed and relieved at how easy it is to use Intellect—even to get the answers to complex questions. Intellect makes the computer the easy-to-use tool it should have been long before now.

Eighteen months ago true English-language data retrieval was not even possible in everyday commercial applications. Although Intellect is a recent and dramatic development, it is already hard at work at over 100 installations in Fortune 500 companies. It has been hailed by publications such as *Business Week* and *Fortune* as the first product to put Artificial Intelligence to practical commercial use. Intellect is used in a wide variety of businesses, such as manufacturing, banking, insurance and retailing—because the system incorporates a lexicon tailored to the way your company does business.

Intellect's ability to understand English is so unique that leading software companies have arranged to integrate it into their product lines. Intellect is marketed by Cullinane Database Systems under the name "On-Line English". Management Decision Systems offers Intellect as "ELI—English Language Interface". Information Sciences markets Intellect as "GRS Executive". Intellect also interfaces directly to ADABAS, IDMS and VSAM, as well as dealing with sequential files.

You don't have to learn a complex formal language to talk to your computer any more. Intellect already speaks your language. We'd be delighted to hear from you.

Richard Bibaud, Vice President of AVCO Corporation's Systems Division, was immediately able to use Intellect's plain English capability to retrieve information from his company's computer.

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For Commercial Users

Talking Computers Still Science Fiction

By Tom Henkel
CW Staff

Product Spotlight

In the now-classic *2001: A Space Odyssey*, author Arthur C. Clarke's vision of the future includes a computer that listens, understands and speaks. The machine — HAL 9000 — not only acts in response to spoken commands, but responds verbally and eventually outthinks its masters.

Unfortunately, while conversing computers are integral to most visions of the future, they are as much a part of science fiction today as they were a decade ago. While researchers have developed impressive voice synthesis devices, many say there is no immediate solution to the difficulty of programming computers to listen.

There are two major problems facing voice recognition technology, according to Steve Levinson, a staff researcher with Bell Laboratories' Acoustic Research Department in Murray Hill, N.J. First, scientists just do not know enough about how humans speak to develop a machine that can understand speech. Second, voice recognition products developed to date have been far from conversational.

Most speech systems require their human users to speak deliberately and sometimes unnaturally. This, Levinson observed, has led to an acceptance problem and lack of demand for voice recognition products. Consequently, lack of demand has stifled widespread research and resulted in voice recognition systems that do not work well enough, Levinson said.

Critics of voice recognition technologies point to one of the first experiments in voice recognition, conducted about 30 years ago at Bell Labs. In that experiment, a machine was taught to recognize isolated spoken digits. Aside from the replacement by silicon chips of the tubes and transistors used in that early experiment, voice recognition technologies have not really progressed much in the past 30 years, according to critics.

Vendors of voice recognition hardware, however, disagree with these assessments. Jeff Gruza, manager of marketing development for Threshold Technology, Inc., a leading voice systems builder, admitted that voice recognition techniques are not yet perfect, but the main problem is that users sometimes overanticipate the advantages of a recognition system. He claimed that many firms have successfully implemented voice recognition systems, and most have boosted productivity or have overcome a tough problem by switching to a voice recognition system.

Typical voice recognition applications include data entry, particularly in unusual or harsh environments, quality control and merchandise

(Continued on Page 12)

MANUFACTURER AND MODEL	Auricle, Inc. Auncle I	Centigram Corp MIKE	Interstate Electronics VRC008/100-1	Interstate Electronics VRM041/102	Interstate Electronics VRT101	Interstate Electronics VRQ400
COMMUNICATIONS INTERFACE	RS-232-C & IEEE 488	RS-232-C, parallel	Parellel	Parallel RS-232-C, 20 mA	Two RS-232-C ports	DEC Q-Bus
PROCESSING FACILITIES						
Type	Z-80	2-80	NA	NA	Dual Z-80	NA
Main memory	16K RAM	48K RAM, 4K EPROM	External RAM	RAM, ROM	48K RAM (CPU)	RAM ROM
Software	Firmware	Proprietary	Firmware	Firmware	VOICE (proprietary)	Firmware
SPEECH CHARACTERISTICS						
Recognition technique(s)	Spectral analysis, pattern recognition	Spectral analysis, word framing, pattern generat	Voice pattern waveform analysis, template match.	Pattern generation, pattern matching	Pattern generation, pattern matching	Pattern generation, pattern matching
Maximum number of speakers supported	Unlimited	1	1	1	1	1
Maximum number of voice references stored	Unlimited	96 words	8 (VRC008) 100 (VRC100-1)	40 (VRM041), 100 (VRM102)	100	100
Handle continuous speech?	No	Yes, phrases	No	No	No	No
Percent recognition accuracy	99	NA	90(VRC008),99+(VRC100-1)	99+	99+	99+
Average response time	Less than 1 sec	NA	200 ms (VRC008) 250 ms (VRC100-1)	65 ms (VRM041), 125 ms (VRM102)	125 ms	125 ms
Additional characteristics	—	Voice response capability	VRC008 speaker inde both sys are chip sets	Both board level systems	Fully self-con intell term with voice recog	Single-board unit for DEC VT103 and LSI-II
TYPICAL APPLICATIONS	Development system for OEMs	Data entry, control functions, file inquiries	Data entry, inven con consumer systems, toys	Data entry, inven con consumer systems, toys	Data entry, inventory control	Data entry, inventory control
PRICING, AVAILABILITY, AND SERVICE						
Purchase price	$2,480	$1,900 to $3,850	Contact vendor	Contact vendor	Contact vendor	Contact vendor
Monthly rental	—	Contact vendor	Contact vendor	Contact vendor	Contact vendor	Contact vendor
Monthly maintenance	—	Contact vendor	Contact vendor	Contact vendor	Contact vendor	Contact vendor
Quantity discounts	No	NA	NA	NA	NA	NA
Product delivery ARO	Threshold	Contact vendor	NA	NA	NA	NA
Training provided by	Threshold	Centigram	NA	NA	NA	NA
Service provided by	Threshold	Centigram	NA	NA	NA	NA
Number installed	50	NA	NA	NA	NA	—

Delapre Research Corp. Chart

MANUFACTURER AND MODEL	NEC DP-200 CSR	NEC SR-100	Scott Instruments VET-2	Sun Electronics VR-1600	Threshold Technology 600/580	Threshold Technology 600/680
COMMUNICATIONS INTERFACE	RS 232-C, RS-422, GPIB	RS-232-C	RS-232-C via host	Parallel	RS-232-C	RS-232-C
PROCESSING FACILITIES						
Type	NEC DP 200 CSR	NA	Applell,II+host,TRS-80 ht.	Z-80	LSI-1	LSI-11
Main memory	64K D RAM	ROM	32-48K RAM (host)	16K RAM, 4K ROM	64K RAM	64K RAM
Software	—	—	NA	NA	Firmware	Firmware
SPEECH CHARACTERISTICS						
Recognition technique(s)	Dynamic programming	Dynamic programming	Pattern generation, comparison with stored vocab	Pattern generat, pattern matching, data compres.	Spectral analysis, pattern recognition	Spectral analysis, pattern recognition
Maximum number of speakers supported	1	1	1+	1	Unlimited	Unlimited
Maximum number of voice references stored	500 words	120 words	40	32	Unlimited	Unlimited
Handle continuous speech?	Yes	Yes	No	No	No	No
Percent recognition accuracy	99	99	98+	NA	99	99
Average response time	300 ms	300 ms	NA	400 ms	Less than 1 sec	Less than 1 sec.
Additional characteristics	Audio response	—	—	—	—	—
TYPICAL APPLICATIONS	Baggage sorting data entry, inventory	Data entry	Data entry, inven, QC, mach con, num con (NC) system	Data entry, sortation, games, handicapped	Speech recognition subsystem	Voice data entry terminal
PRICING, AVAILABILITY, AND SERVICE						
Purchase price	$20,000	$1,500	Contact vendor	Contact vendor (U.S.)	$8,700-$9,900	$10,500-$11,700
Monthly rental	NA	NA	Contact vendor	Contact vendor (U.S.)	—	—
Monthly maintenance	$400	NA	Contact vendor	Contact vendor (U.S.)	—	—
Quantity discounts	Yes	Yes	NA	NA	No	No
Product delivery ARO	4 months	2 months	NA	Contact vendor (U.S.)	Threshold	Threshold
Training provided by	NEC	Customer	NA	NA	Threshold	Threshold
Service provided by	NEC	NA	NA	NA	Threshold	Threshold
Number installed	40		NA	NA	800 total units	800 total units

Delapre Research Corp. Chart

Fewer Firms Developing Voice Systems: IRD

The charts on Page 10 and below, from Datapro Research Corp.'s "All About Speech Technology" report, detail some of the speech recognition systems currently available.

Product Spotlight

By Tom Henkel
CW Staff

Only a handful of vendors currently offer voice recognition products of varying levels of sophistication. Many of these vendors are relatively small.

Unfortunately, either because of user resistance to the technology or because of the lack of demand for voice recognition systems, there are fewer firms developing or building voice systems today than there were two years ago, according to a recent report from International Resource Development, Inc. (IRD).

In its report, IRD noted that most vendors offer board-level products that are typically incorporated into a CRT terminal or are developed into a hand-held unit. A few voice recognition vendors — Interstate Electronics Corp., for example — offer chip-level recognition systems, according to the report.

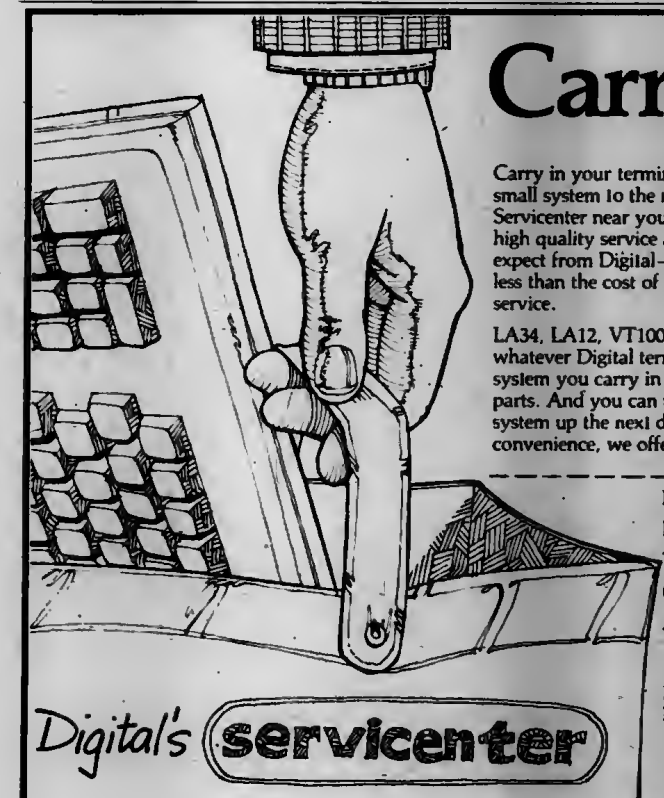
IRD's report on "U.S. Speech Recognition and Synthesis Markets" is relatively optimistic about the entire voice recognition area. In fact, the study maintained that the industry is "poised for huge growth." It will begin to boom near the end of this decade, according to the report released by IRD.

However, IRD tempered its enthusiasm by noting that the speech recognition business is currently at its lowest ebb, with nowhere to go but up.

The report also pointed out that "nobody is making any money" in the voice recognition business.

MANUFACTURER AND MODEL	Threshold Technology VNC-300	Verbex Model 1800	Voicetek Cognivox VIO-1000 Series	Votan V1000
COMMUNICATIONS INTERFACE	RS-232-C	RS 232-C, 20 mA 3270	IEEE-488 I/O port of various micros	RS-232-C
PROCESSING FACILITIES				
Type	DG Nova 4/Eclipse	DEC PDP 11/04	NA	Digital signal processing
Main memory	64K RAM	256K RAM	NA	128K RAM
Software	Firmware	Proprietary	NA	NA
SPEECH CHARACTERISTICS				
Recognition technique(s)	Spectral analysis, pattern recognition	Vector processor multiple reference templates	Pattern generation pattern matching	Dyn prog pattern matching digital filt
Maximum number of speakers supported	Unlimited	8 simultaneously	1	Unlimited
Maximum number of voice references stored	Unlimited	10+ (recog.)	3	255
Handle continuous speech?	No	Yes	No	No
Percent recognition accuracy	99	99+	98	99+
Average response time	Less than 1 sec.	NA	0.3 sec	0.3 sec
Additional characteristics	—	Optional voice response capability	Speech output—32 words or phrases available	Speech output available
TYPICAL APPLICATIONS	Single-user voice numerical control system	Data entry, banking order proc., airline reserv.	Data entry, games data entry, educ. handicapped	Data entry/retrieval, control func., trans. proc.
PRICING, AVAILABILITY, AND SERVICE				
Purchase price	$42,650 to $68,765	$65,000 and up	$295	$3,200 to $4,200
Monthly rental	—	Contact vendor	—	—
Monthly maintenance	—	Contact vendor	—	—
Quantity discounts	No	NA	Yes	Yes
Product delivery ARO	60-90 days	NA	2 days	30 days
Training provided by	Threshold	Verbex	Customer	Votan OEM
Service provided by	Threshold	Verbex	Factory	Votan OEM
Number installed	46	NA	Over 11,000	NA

Datapro Research Corp. Chart



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Talking Computers Still in Realm of Sci-Fi

(Continued from Page 10)

sorting. Basically, any application that demands undivided use of a person's hands and eyes is ideal for voice recognition, Gruza said.

General Electric Co. has installed about six voice recognition systems over the past four years to perform quality-control functions in various manufacturing plants. Applications there range from testing printed-circuit boards to building major appliances, according to Jeff Erlich, manager of applied-technology at GE's Bridgeport, Conn., Computer Management Group.

Unlike voice recognition critics and pundits, Erlich maintained that, despite lack of widespread acceptance, current voice technologies are fine. However, the stumbling block may be interfacing spoken input with standard data processing hardware. Instead of more research devoted to advancing speech recognition techniques, Erlich said he would prefer to see more packaged systems designed to mesh with traditional computer and other manufacturing hardware.

"In one case, I have a usable product; in the other case, I have nothing," he noted.

The keys to a successful voice recognition system, Erlich pointed out, are attention to detail and developing a system that is convenient for factory workers to use. That means incorporating commonly used jargon into the system so the worker talks to the recognition system in much the same way he talks to his associates, he explained.

Factory workers at GE reportedly like their computerized speech system because the workers "don't have to speak in an artificial way," Erlich said. The main reason for acceptance has been the use of systems that are tailored to the users, as opposed to simply replacing a terminal with a microphone, he claimed.

While voice systems are, for the most part, still in their infancy, the technology has made significant strides since Bell Labs' tube and transistor experiment about 30 years ago. For instance, while most voice recognition systems on the market today are user dependent (meaning the systems are geared to a single user's voice pattern) and require the user to pause between inputs, advancing memory technology has increased system vocabulary.

In addition, advances in peripheral technology, such as improved microphones and filters, have reduced some earlier problems of background noise, which previously forced users to repeat inputs or virtually shout commands into the machines.

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Ramis Updated, 'Atlas' Unveiled

(Continued from Page 1)

linane Database Systems, Inc.'s IDMS, Software AG of North America's Adabas and Cincom Systems, Inc.'s Total.

Reporting extensions added to Ramis provide basic statistics facilities, flexible underlining, enhanced test display and selection of groups of records based on summary values, the vendor said. The extensions, which expand the range of report types available on Ramis II, are provided at no extra charge.

The enhanced release of Ramis also includes improved access to Vsam files via primary or alternate keys and improved processing of calculation statements, the vendor reported.

CICS Competitor

The Atlas data communications monitor unveiled last week by Mathematica was designed to take advantage of new DOS/VSE Release 2.0 capabilities. Applications written for Atlas can use any operating system facility without impacting other applications or the Atlas system, the vendor said.

Atlas is invoked through a standard call interface; no precompilation processing is required for applications. Mathematica said that while running at 10% capacity, the monitor can process an average of 6,000 transactions per hour submitted from 200 terminals.

The package supports IBM 3270 terminal screens and teletypewriter devices and includes a dial-up capability for 3270s that requires no special hardware or operator intervention, Mathematica claimed. High-level mapping support is available.

Files can reside on a variety of direct-access storage devices and either monitor-serviced or direct program file I/O can be used. File I/O automatically precludes deadlock situations and prevents concurrent update problems, a spokesman noted.

Atlas is upward compatible from MPGSwift II, Mathematica's data communications monitor for smaller terminal networks operating under DOS, DOS/VS or DOS/VSE.

A typically configured Ramis II ranges in price from $48,000 to $130,000, depending on CPU power. Relate is priced at an additional $15,000 and the FSM costs $12,000. Atlas is available for $14,000 until April 1, after which the price doubles to $28,000.

Mathematica can be contacted at P.O. Box 2392, Princeton, N.J. 08540.

Wants 'Thorough Public Examination'

House Asks Delay of Surveillance System

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — A House of Representatives subcommittee has asked the Secret Service and the Justice Department to delay development of a computerized surveillance system for tracking people considered threats to the president and other high-level officials until there is "a thorough public examination" of the proposal.

The House Judiciary Subcommittee on Civil and Constitutional Rights had planned hearings on the proposal for mid-December, but ran out of time at the end of the last congressional session. They will be rescheduled for early this year, a subcommittee aide said last week.

In an exchange of letters between the subcommittee and the two agencies involved, subcommittee chairman Don Edwards (D-Calif.) said the panel has "grave concern" about the privacy, civil liberties and First Amendment questions raised by the proposed system, which would use the Federal Bureau of Investigation's National Crime Information Center (NCIC) DP/telecommunications system.

In a strongly worded letter to Attorney General William French Smith, Edwards and Rep. F. James Sensenbrenner Jr. (R-Wis.), a ranking minority member on the subcommittee, detailed the questions the subcommittee wants answered to allay its "serious reservations" about the proposal.

Subcommittee Questions

Besides questioning the Justice Department's legal authority to implement the system on its FBI computers without specific legislation, Edwards and Sensenbrenner asked: "What are the criteria by which individuals are placed on the Secret Service list? Are these criteria subject to change? What restrictions are placed on dissemination of information once it is received by local police? What remedy, if any, does an individual have — and against whom? — if the information is improperly disseminated? How are individuals to be identified, [for example], name, date of birth, social security number [and so on]? What is the nature of the message that will be transmitted by NCIC to the local police?

"In addition," the letter said, "what assurance do we have that this system will not evolve into the sort of system maintained by the Secret Service in the 1970s when 'dangerousness' and 'threat' were interpreted to include poltical dissent? In 1972, the Secret Service had nearly 50,000 individuals on its lists, including such 'threats' as Jane Fonda, Tom Hayden, Ralph Abernathy, Cesar Chavez, Benjamin Spock and Walter Frauntroy."

The subcommittee members asked that no further steps be taken to implement the system until there is "a thorough public examination" of the proposal.

According to the Secret Service, however, it already has the legal authority to list its data with the NCIC. The agency added in a reply to Edwards that the system "will be very cautiously administered."

Use of NCIC To Track People Never Approved

Proposals to use the Federal Bureau of Investigation's National Crime Information Center (NCIC) DP/telecommunications system to check the whereabouts and activities of persons identified as possible threats to government officials under Secret Service protection have been considered for years. However, Congress has never authorized implementing such a system.

In addition, the Treasury Department — parent agency of the Secret Service — concluded 1½ years ago that the government would need a "massive" computer system to identify adequately and track the thousands of persons that might pose a danger to the president. Even then, Treasury said, the success of such a system would depend largely on "mere chance" [CW, Sept. 7, 1981].

Despite that conclusion, reached in a Secret Service management review following John W. Hinckley Jr.'s attempted assassination of President Reagan, Treasury asked the FBI to list those individuals already identified as possible threats by the Secret Service. Through the NCIC system, local law enforcement pesonnel would notify the FBI when they came in contact with anyone listed in the file and thereby help the Secret Service keep track of them.

When the House of Representatives Judiciary Subcommittee on Civil and Constitutional Rights learned of the Secret Service-FBI plan late last year, it insisted that Treasury delay its implementation until the subcommittee could review the proposal.

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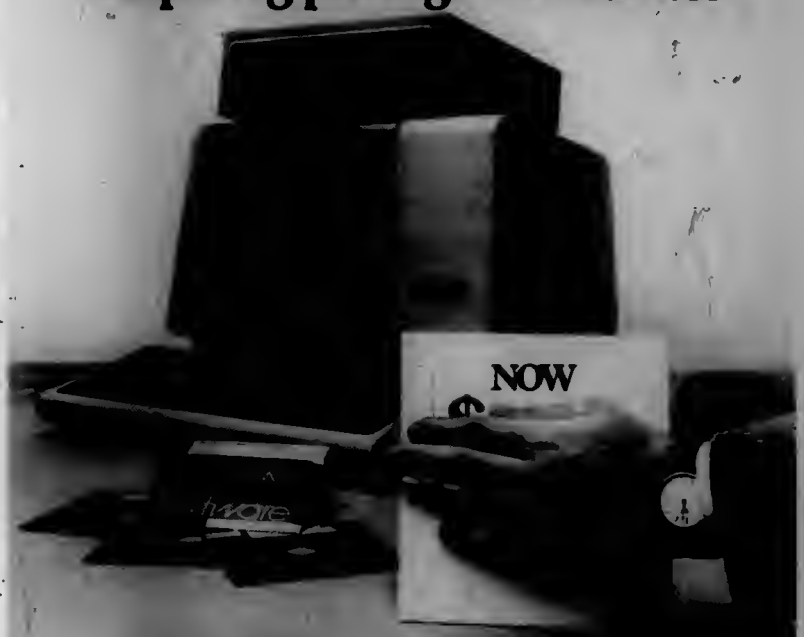

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BOCs Planning Two Networks

(Continued from Page 1)

formed by 19 of the to-be-divested Bell operating companies. The organization is performing common administrative, engineering and market development functions.

The local-area data transport service will be demonstrated "later this year in Florida," Polsen said. Other sources reported that the exact site will be Miami, where local-area data transport will support the large-scale videotex market trial that AT&T is sponsoring in conjunction with Knight-Ridder Newspapers. The system is expected to transmit data at speeds up to 8K bit/sec over existing local loops, using frequencies above the 4 KHz band employed for voice transmission.

The second service, Polsen said, will transmit 56K bits per second end-to-end using existing local loops and circuit switching. A technique known as time compression multiplexing will provide the data transmission capability, he added.

According to other sources, the local loop will still be usable, on an alternate basis, for telephone conversations. By operating a switch, the user will be abla to change from one mode to the other.

At the four-day ICA seminar on "Local-Area Networks and Beyond," Polsen also discussed the underlying strategy that the Bell operating companies will pursue after divestiture. Their goal is to provide "a full range of transmission capabilities including voice, data, image and video transport."

The local-area data transport and circuit-switched networks will mark "the beginning of the transition from today toward the future Bell operating company integrated switched digital network," Polsen said. Specifically, both new networks will support a universal physical interface now being developed by U.S. and international standards-making bodies.

Ultimately, the new standard will enable the Bell operating companies to meet the need — which "many users have identified" — for "a single interface [that] can provide for a full range of applications and services without requiring separate physical or protocol arrangements or special engineering," Polsen said. "Services will be provided across the interface independent of the technology and configoration of both the telecommunications network aod the user's equipment."

While this scheme should make it as easy to move and reconnect a data terminal as it is now to move and reconnect a telephone, there will be special benefits for certain users, Polsen indicated. He pointed out that one application for the Bell operating companies' new network offerings, as well as for their rapidly growing digital T1 channels, is to interconnect local-area networks.

"If standard interfaces are used, then neither the [local-area network] terminal nor the gateway are dependent on the technology [or] protocol" of the local-area network. Expansion of the network, maintenance and administration then become much easier, he explained.

AT&T Tariff Cuts International Rates

WASHINGTON, D.C. — AT&T filed a tariff this month with the Federal Commonications Commission (FCC) that promises substantial rate cuts for international voice and data communications users and which is likely to become effective in April.

The tariff reduces the phone company's charges for its private international voice-grade circuits and for the first time permits them to be used alternately for data transmission. The circuits would handle speeds up to 9,600 bit/sec.

AT&T's basic rate for a leased voice-grade channel between the East Coast and the UK or Ireland is presently $5,066/mo. The new charge would be $3,400.

The basic rate covers the portion of the international circuit supplied by a U.S. carrier. Charges for the domestic U.S. access circuit and for facilities provided by a foreign carrier are additional.

The AT&T tariff would also reduce the price of alternate voice/data service, which is now available only from U.S. international record carriers (IRC). An alternate voice/data circuit between the East Coast and the UK, which currently carries a minimum basic monthly rate of $3,590, would be reduced by nearly $1,600/mo.

Circuit Conditioning Extra

However, alternate voice/data service from the IRCs includes circuit conditioning. AT&T plans to charge extra for this item.

AT&T's current monthly rate for a voice-only international private line to Europe is $5,066; to Africa, $5,066; to Central America, $4,466; South America, $5,347; and to the Pacific, $7,195. In its tariff, it proposes the following monthly rates for a voice-only or an alternate voice/data international private line: Europe, $3,600; Africa, $3,800; Central America, $3,200; South America, $3,800; and the Pacific, $4,300.

The IRCs' current monthly rate for an alternate voice/data international private line to the UK and Ireland is $3,590; to Europe, $3,710 to $4,120; to Africa, $4,120; Central America, $3,380; South America, $4,100; to the Pacific, $4,369 to $5,520.

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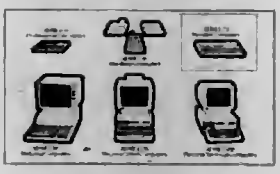

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In Wake of Bell Breakup

ICA Seminar Ponders Intracity Net Viability

By Phil Hirsch
CW Washington Bureau

ORLANDO, Fla. — Intracity communications networks received a lot of attention here last week at the International Communications Association's (ICA) seminar on "Local-Area Networking and Beyond" — and for two very good reasons.

First, observers of the telecommunications scene generally agree that the breakup of the Bell system will increase local-exchange rates. However, in attempts to reduce their noncommunications costs, many companies are installing additional on-line information systems, which makes the shortcomings of the telephone carriers' analog local loops more serious.

Secondly, the ICA is a users group whose members represent the nation's largest corporations — the most likely users of intracity communications networks.

The basic question addressed here last week was which of the many intracity communications networks' technologies is most viable. Much of the commentary on that question came from consultant Brad O'Brien. O'Brien's company, the Perspective Telecommunications Group of Paramus, N.J., will shortly publish an analysis of the emerging intracity communications network market. Among O'Brien's major points were:

• CATV networks are very likely to become intracity communications networks, but they will be carriers rather than providers of end-to-end service. Reason: most of the new two-way cable networks are being installed in suburban areas rather than urban areas, where prospective intracity communications networks users are clustered. Moreover, CATV operators do not know enough about data communications; entertainment TV is "another country," O'Brien said.

• Digital termination systems (DTS) are also likely intracity communications networks, primarily because many of their suppliers are carriers with existing customer bases that could reduce their costs appreciably by replacing telephone company analog circuits with their own DTS microwave links.

• Private microwave is particularly attractive in downtown areas, where cable-laying costs tend to be high. However, bad weather seriously degrades the performance of these links.

• Private cable is attractive technically because it is not distance- or bandwidth-limited. The big drawback is the time needed to acquire right of way for the cable and the high cost of laying the cable. O'Brien believed that in at least some cities, owners of conduit, such as electric power companies, may form partnerships with intracity communications network carriers.

• The success of all these "bypass" technologies will depend largely on how the Bell operating companies respond. About 5% of the nation's local-loop plant is now being digitized annually. Meanwhile, the number of T1 local loops usable for digital voice as well as high-speed (1.5M bit/sec) data transmission is increasing.

On this latter point, O'Brien estimated that the Bell operating companies probably will lose no more than 3% of their customer base to competing intracity communications networks. But, he pointed out, this represents some $500 million in annual revenue, enough to make intracity communications networks viable.

Simon Disagrees

Art Simon, director of marketing for the Commercial Services Division of Warner Amex Cable Communications, Inc., disagreed strongly with O'Brien's comments about CATV. His company is almost ready to turn on a dedicated business cable network in Pittsburgh, Pa., that will serve the downtown area. Similar facilities are under construction in Dallas, Cincinnati and Milwaukee.

Simon also contended that his company and other CATV operators are eager and able to provide end-to-end data communications services.

Joe Tokarz, manager of applications engineering for General Electric Co., a major manufacturer of 18- and 23-GHz private microwaves, insisted that the only serious attenuation problem affecting these systems is heavy rain. In a city like Washington, D.C., which has a normal rate of rainfall, transmission at speeds of 3M bit/sec to stations five miles away is routine. He added that these links provide 100% reliability and bit error rates of 1:10 (-9).

'It Folds, Spindles, Mutilates!'

PBXs Seen Vital to Data Communications by '88

By Bruce Hoard
CW Staff

Even though private branch exchanges (PBX) are now used primarily for voice communications, they will become extremely important to data communications in general over the next five years.

However, digital PBXs are far from ready to replace their analog counterparts.

That was the predominant impression conveyed by 10 data communications managers contacted by *Computerworld* during an informal survey last week. Their comments came as American Bell, Inc., AT&T's unregulated subsidiary, was believed poised to unveil Antelope, the first digital PBX expected to come out of Bell Laboratories, Inc.

International Paper Co. in Mobile, Ala., has several PBXs, but is running limited data through them via a few slow-speed, dial-up terminals, according to Gerald H. Williams, supervisor of voice and data communications. The company has no plans to add data capabilities, Williams said, because "we haven't seen any big reason to do that yet."

Despite that fact, Williams said that PBXs will be "extremely important" to data communications over the next five years.

Cal Rader, director of communications for Western Airlines in Los Angeles, said that Western has put out a request for purchase for a new corporate telephone system to be built around a PBX. The company has narrowed its choices down to such major vendors as Rolm Corp., Northern Telecom, Inc., Datapoint Corp. and American Bell.

"I think anyone would be kind of crazy right now to turn out a [request for purchase] for something as sophisticated as a PBX without putting American Bell in the loop," he said.

Rader said that PBXs will be an integral part of data distribution in offices over the next five years, noting they will be used to connect terminal equipment to host processors.

Vincent A. DeGennaro, manager of telecommunications planning with American Can Co., Greenwich, Conn., said over the next five years, "PBXs will be the transmission medium throughout the office." Although American Can is currently running voice only over its AT&T Dimension, it will acquire the data add-on feature for it before the year is out.

DeGennaro noted that digital PBXs hold an advantage over analog models in their ability to save money by going "modemless" from port to port. Like most of the other respondents, he rated service and reliability as the most important factors to consider when getting a PBX.

One data communications manager who wished to remain anonymous said data transmissions on his firm's voice-only PBX "would be helpful" and added he would like both analog and digital capabilities in the same unit.

On the five-year future of PBXs, he said, "I would suspect they would become very important in that microcomputers will be attached to them."

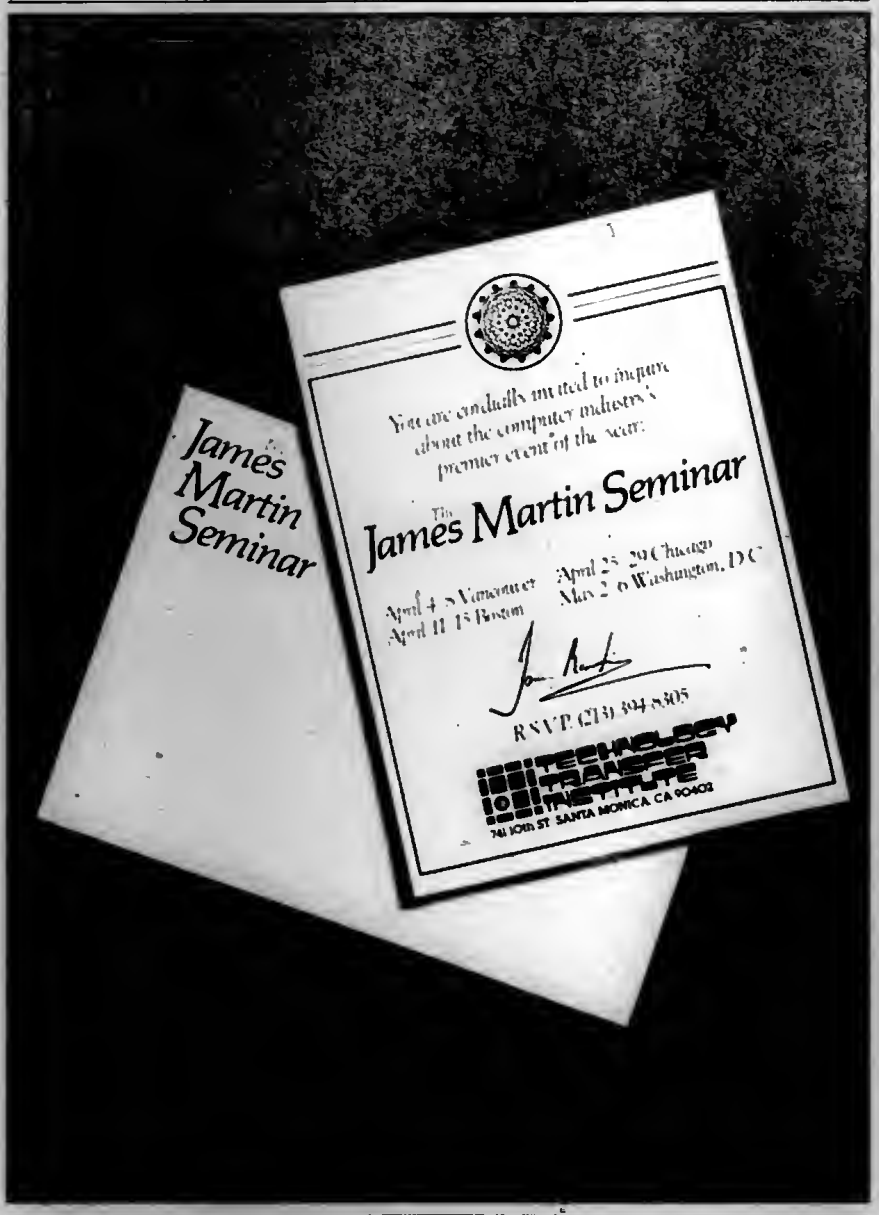
Digital PBXs remain a thing of the future for R.L. Walsh Sr., manager of telecommunications for General Cable Co. in Greenwich, Conn. "We serve three different locations so we still have to get out there in the analog world between buildings," he said.

General Cable intends to buy a Dimension and is considering the data add-on feature, he noted. Walsh said the transition to digital may be slower than is anticipated "except for the leading edgers."

Potomac Electrical Power in Washington, D.C., will have a PBX within a year, according to telecommunications manager Mario S. Valentini. He said that PBXs will become "extremely" important over the next five years.

Another anonymous respondent said his company was using its Dimension for voice-only communications and has no plans to add data capabilities. He said that over the next five years PBXs will be "an important part of the total mix."

He rated flexibility as the most important factor to consider before acquisition, saying, "I'd want to make sure I didn't get locked into some limited growth path."



Ex-Fed Worker Pleads Guilty

WASHINGTON, D.C. — Former Federal Reserve Board employee Theode C. Langevin pleaded guilty last week to illegally tapping the Federal Reserve's computers after leaving the government to work for E.F. Hutton & Co. in New York.

Langevin had been charged in federal court here with one count of wire fraud in connection with gaining access to the Federal Reserve data bank on money supply projections in late November [CW, Jan. 10]. The data is potentially valuable for brokerage houses trying to predict government interest rate actions.

Langevin, who will be sentenced next month, faces a possible five-year jail term and a $1,000 fine. However, government prosecutors indicated they will not seek a jail sentence for the former Federal Reserve employee.

With Corporate Info Explosion

MIS Managers Say DP Planning a New Game

By Robert Batt
CW West Coast Bureau

The likelihood that large corporations will witness an unprecedented display of computing power at all levels this year is sending management information systems (MIS) managers scurrying to come up with systems planning procedures for coordinating this information explosion.

Complicating their task is the fact that computer technology is no longer the domain of only the MIS department. Users working on powerful new microcomputers are becoming ever more sophisticated, leaving DP managers to struggle with the problem of how to allow computers to proliferate within their organizations without losing control of the technological direction of those organizations.

Further intensifying the problem is the lack of a management tradition to fall back on. "There are severe shortcomings in current planning methodologies," observed Marc Steuer, director of planning and field support for corporate information services at Syntex (USA), Inc., a pharmaceutical company in Palo Alto, Calif. "There is no one methodology that can take the plan from its strategic concept and translate it into systems development."

According to the seoior vice-president for an international banking firm, systema planning has catapulted into the arena of high-risk policy management, with many organizations having to make vital decisions on future technological directions within the next few months. "We have to make some fundamental decisions on the basis of what is unknown, and that is very scary," he said. "There is no tradition of management or technological thinking to stand on. The problems of growth mean that successful corporations are hitting technological barriers they have never faced before, entailing big risks."

In the absence of an accepted method of systems planning, leading companies are functioning on a trial-and-error basis. Syntex, for example, is setting up a planning project in the area of telecommunications.

"We are trying to develop a planning approach that encompasses both short-term and long-term objectives," Steuer explained. "Telecommunications is going to be an important part of supporting a business. Two years from now we will be greatly concerned with telecommunications capabilities, high-level languages and processing capabilities, yet there is little in the marketplace to guide us in how we should implement such a strategic plan."

Steuer sees systems planning within Syntex consisting of planning in the areas of data base technology, telecommunications and resources. His approach is to let the Information Services Division concentrate on the technology, while leaving applications development largely up to the end users.

"Our current approach to prioritizing needs to be revised," he pointed out. "In the future, applications will be the purview of the users, and we almost won't care what they do. To get to that point, however, we will need a strong infrastructure of basic business systems, such as accounts payable and modeling sys-

(Continued on Page 18)

Manager Doubles As Consultant

PALO ALTO, Calif. — Marc Steuer's job description is an unusual one. As director of planning and field support for corporate information systems at Syntex (U.S.A.), Inc., he acts as both a manager and a consultant for the pharmaceuticals enterprise.

Steuer went to Syntex in August 1981 after a career that included a job as a computer designer for an aerospace company in Bethpage, N.Y., and others as a management consultant for the accounting firms of Touche Ross & Co. and then Booz-Allen & Hamilton, Inc. "I wanted a company where I could participate in all facets of bringing information technology into a company. It had to be large enough so I would not feel too constrained," said Steuer, who has a master's degree in electrical engineering and an MBA in accounting.

"At the same time, there would need to be a diversity of challenges and an environment where management was progressive enough to fully back the need for development in the information technology arena," he said.

Syntex needed someone who could provide both systema planning skills and direct consulting assistance throughout the company. With Steuer's arrival, the company divided the corporate information systems' function: One area focuses on developing methodologies for planning, while the other uses these

(Continued on Page 18)

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Managers Facing Planning Game

(Continued from Page 17)

tems."

Several other companies are making a concerted effort to involve users more in the development and application of technology. At Continental Airlines, for instance, the philosophy is that users must become far more involved in the systems definition and planning process than they have been.

"The growth of information centers is giving users a bigger vote in systems development, and it is time for us in information services to go out and collect the bailots," said Charles Connoy, recently appointed Continental's director of systems and planning. "Users must be involved in satisfying their own information demands."

Connoy warned that if systems planning managers do not find ways to bring users into the planning process, serious organizational discord could result. Users can go out and buy their own microcomputers, he noted, so a company can quickly lose control of the direction of its technology and of data within the company.

Systems planners, Connoy argued, should treat data processing as a business function, concentrating on such areas as interaction with user departments, costs and training programs. "The systems planning manager needs to answer some important questions. For example, does the hardware plan match the applications plan? Are the information center or office automation plans consistent with the overall business strategy?"

At Denny's, Inc., in La Mirada, Calif., systems planning has been in operation for three years. Each year the company devises a long-range systems plan in conjunction with a five-year business plan.

The aim is to develop a technology plan to meet the business' needs. Areas of systems planning include technological issues, sequence of applications, costs and manpower requirements.

Despite the well-established nature of this exercise, however, Richard Kislowski, MIS director at Denny's, feels his firm still has some way to go."We are not yet ready to make the transition to an information resource concept. Right now we are at an application planning stage, and we want to make the transition to the data planning stage."

What that will entail, said Kislowski, is an emphasis on identifying what data the company wants to make accessible to users, atoring and capturing such data.

Job Combines Two Skills

(Continued from Page 17)

methodologies for integration into consulting services throughout the company's field operations.

"One of the problems with planning is that if it is not done in a real-life, practical context, then the things you are planning have no real application to the needs of the company. On the other hand, to neglect forward planning risks the danger of neglecting the strategic needs of the company, so it's a question of balance," Steuer pointed out. He sees his job as determining which way the balance should be tipped at any particular time.

According to Steuer, for much of its history Syntex was managed as a group of individual enterprises with separate divisions having a good deal of autonomy. Under a recent reorganization, however, management of the operating units has been brought under the company president, Richard Rogers.

The job of the planning and field support management is to make sure that the right problems are being worked on in the information services area, so that DP activities are in concert with the company's business strategy. "The real questions tend to be whether we need a new accounts payable system or whether the real need is for a process control and cost system for our manufacturing plants. Without strategic planning, focusing and prioritization, you may never know if your DP guys are working on the right things,"Steuer said.

Syntex is now embarking on a series of projects to increase the scope and effectiveness of systems planning. Under Steuer's guidance, the company is setting up a projects team comprised of specialists in the area of office automation, industrial engineering and human resources to look at the behavioral aspects of productivity as they pertain to planning.

"To date, nobody has come up with a methodology to quantifiably figure out how to apply information technology in the managerial/professional domain," Steuer said. "We will start up projects and take a holistic approach to not just synthesizing processes in a department or improving managerial ability and team work, but also to making careful measurements before and after a project to get a chronology of what worked and didn't work as part of a total approach to this whole area of planning."

Steuer said this kind of practical research is necessary because the behavioral impact of the work carried out by the management information systems function is too frequently ignored. "When I look at a typical systems analyst or industrial engineer, I begin to question whether he really needs to be doing what he is doing," Steuer said.

"By taking this holistic approach, I believe we can substantially increase productivity and get satisfied users at the same time."

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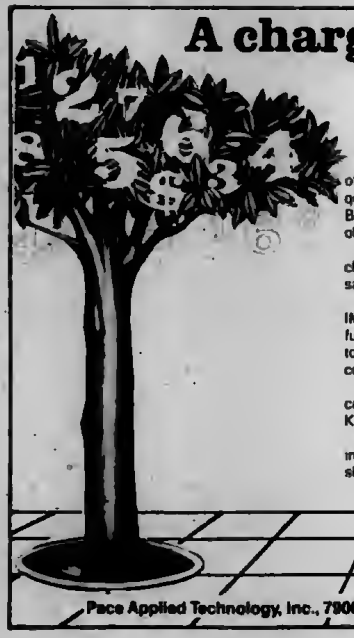

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SSA Data Center Move Wins 'Golden Fleece'

WASHINGTON, D.C. — Did redundancy and mismanagement in planning the move of the U.S. Social Security Administration's (SSA) data center, cost taxpayers unnecessary millions?

Sen. William Proxmire (D-Wis.) thinks so. The Wisconsin Democrat has tapped the SSA's planning effort as the recipient of his monthly "Golden Fleece" award, periodically handed to what Proxmire considers the federal government's biggest spending boondoggle.

Unfortunately, Proxmire's charges are destined to go unanswered. SSA spokesmen have refused to comment on the allegations.

Proxmire's version of the story goes like this: The SSA in 1979 assembled a top-ranking management team of government employees to plan the data center move, which was carried out last year. This team, Proxmire claimed, consisted of 13 management-level employees with various backgrounds, each earning $30,000 to $57,500 per year, with an average salary of about $41,000.

This team, the senator's office said, was "supposed to plan and prepare the move on its own . . . without outside help." In 1980, however, top management at SSA began looking for private consultants to assist in the planning effort. This request was subject to the nonbinding review of the SSA's Office of Human Resources, which, Proxmire's office claimed, recommended against seeking outside consultants "because it felt government employees could do the job themselves."

The Human Resources recommendation notwithstanding, the SSA went ahead and spent $6.7 million on two consultants to plan and prepare the move, Proxmire said.

"This was overt duplication . . . and a needless waste of taxpayer dollars," a spokesman for the senator said, adding that either the $6.7 million consultant fee or the approximately $1.5 million spent on salaries for the SSA planning team was unnecessary.

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The conference will cover the following topics: "IBM Mainframes and Data Base Directions," "IBM Office Systems Strategies," "SNA: A Moving Target" and "Living in a Mixed Vendor Environment: A Gateway Approach."

Other topics include "IBM Satellite Processor/Supermini Counterattack," "Implementing MVS/XA: A View From the Trenches" and "New Markets: Communications Products and Communications Services," a spokesman said.

The registration fee for the conference is $795 for the first person from each company and $695 for each additional attendee from the same company, according to a spokesman.

The Yankee Group is located at 89 Broad St., Boston, Mass. 02110.

One-Day Course To Cover Micros

DENVILLE, N.J. — Haverly Systems, Inc. is offering a one-day course for training executives in the purchase and use of microcomputers.

Attendees will reportedly gain the ability to provide corporate management and senior staff with an understanding of what microcomputers cost, what they can do and how they can be effectively applied in the technically oriented company.

The course, delivered at the user site, costs $235 per person. Haverly is based at 78 Broadway, P.O. Box 919, Denville, N.J. 07834.

OA Seminar Set for March 8

ANN ARBOR, Mich. — The Facility Management Institute will sponsor a seminar on "Office Automation: The Facility Management Perspective" March 8-10 here.

The seminar will provide managers responsible for facility decision making and management with information to develop and implement standards to support technology in office environments. It will look at existing office automation standards and explore how better standards can be developed, according to a spokesman for the institute.

The seminar, which costs $500, will be held at the institute, 3971 S. Research Park Drive, Ann Arbor, Mich. 48104.

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Mass. Finds Way to End Pensions for the Dead

By Bill Laberis
CW Staff

BOSTON — The dead are not allowed to rest in peace in the Computer Age, especially if they are collecting pensions.

The Boston-State Retirement System has inked a contract with a local company to purchase a continuously updated, computerized data base listing the Social Security numbers of deceased persons. The purpose of the contract, according to a retirement board spokesman, is to prevent the mailing of pension checks to deceased pensioners, whose family members might be able to cash the checks illicitly.

The need to tighten up check-dispensing procedures became apparent last summer when it was discovered that the board had been sending checks to a pensioner who had died five years before. The pensioner's family had been forging the checks and then pocketing the pension payments, according to Brian Leahy, executive secretary to the retirement board. A preliminary investigation turned up several other cases of apparent misuse of pension funds by the families of deceased pensioners.

Leahy's office then sent out notices to its 14,500 pension recipients, ordering them to submit a signed and notarized copy of a letter as proof of their being alive. The recipients were warned that failure to return the letters by a specific time would cause the board to stop sending out the monthly pension checks.

As a result of the mailing, the board stopped payment on 156 pensions, representing a savings to the board of over $700,000 of the $85 million it pays out per year.

'No Way of Checking'

"But what we found was that we had no way of checking for validity of pension claims, whether anyone was actually alive or dead," Leahy said. "The notarized signatures gave us proof of who was alive at that time, but we needed some way of updating our files. We obviously couldn't rely exclusively on the honesty of others."

Because Boston had come under fire early last year after allegations that it had granted and dispensed sizable disability pensions to politically connected individuals, the retirement board wasted little time in trying to correct its problems with pensions.

Hooper Holmes, Inc., a service bureau headquartered in Basking Ridge, N.J., contacted the retirement board when news of the deceased pensioner problem was made public. Under the contract it signed last week with the retirement board, Hooper Holmes will periodically compare the data base of Boston's retirees with its continuously updated data base of deceased persons, within which is contained approximately 12 million names.

Identification Check

Hooper Holmes will then send a report via magnetic tape back to the retirement board, which will program its system to spit out any identifications appearing in both the retirement board's and Hooper Holmes' data bases. According to Anthony LaRocca of Hooper Holmes, utilization of the data base, which lists the identifications of Americans who have died since the '60s, is 98% effective in catching pension fraud.

"Catching just one or two people would pay for the whole system," Leahy commented, because the cost of the computerized data base service to the retirement board is "about $75 per 1,000 names per month."

The Boston antifraud measure is similar to steps taken by the U.S. Social Security Administration in Operation Spectre, which is using two computerized data bases to track down an estimated $40 million in SSA overpayments to the survivors of federal aid recipients [CW, March 8]. Over 6,000 names to date have been deleted from the list of Social Security Administration recipients since Spectre began, according to government officials.

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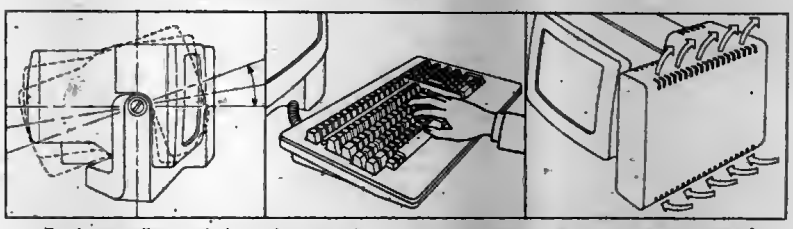

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TeleVideo Systems, Inc.

GSA to Help FAA Speed Up System Purchase

WASHINGTON, D.C. — The Federal Aviation Administration (FAA) and the General Services Administration (GSA) have signed an interagency agreement to help speed the FAA's procurement of new air traffic control (ATC) computers.

Under the agreement, GSA has assigned Agency Liaison Officer John Hargett on a full-time basis to assist the FAA with the acquisition of host computers to replace the present third-generation IBM 9020s in the FAA's 20 air route traffic control centers. The new computers will host the existing 9020 software and will be fully compatible with the present radar display equipment, according to an FAA spokesman.

Hargett will advise the director of the FAA's Advanced Automation Program Office, Valerio R. Hunt, on technical, policy and regulatory matters related to the computer replacement program. Hargett will also coordinate and facilitate GSA activities in support of the program.

The FAA issued a request for proposals Dec. 30 for the initial computer system design competition phase, with a Feb. 17 deadline for proposals. Sperry Univac and IBM are expected to bid.

The competition systems will be tested and evaluated at the FAA Technical Center in Atlantic City, N.J., and one manufacturing team will be selected to proceed with production. The first delivery is scheduled for 1985 with all slated to be on site by the end of 1987.

Concurrent with the rehosting effort, the FAA will also proceed with the development of new controller workstations known as "sector suites," which will have their own microprocessors, and the software for the workstations.

A separate competition for that system is planned. Delivery of that equipment is scheduled to begin in the late 1980s.

While the FAA currently operates 20 air route traffic control centers in the contiguous 48 states, the agency plans to reduce that number to 16 by 1990.

Western Electric to Evaluate Replacement Plans

WASHINGTON, D.C. — Western Electric Co. has received a contract to evaluate Federal Aviation Administration (FAA) plans to replace the IBM 360-architecture mainframes in the agency's air traffic control system.

Replacing the IBM 9020 mainframes — now in operation at 25 air traffic control centers and at several FAA support facilities — with compatible machines is the first phase of the "national airspace system plan," the $9 billion FAA automation project announced last year [CW, Feb. 8].

The Department of Transportation said the Western Electric contract is for "an independent, outside analysis based on analogous Bell system experience to review the rehost objectives, assess the FAA's estimates of software changes required for rehost" and to offer recommendations for successful rehosting.

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HP 1000 Users To Meet April 26

LOS ALTOS, Calif. — The theme of the 1983 International Conference of Hewlett-Packard Co. HP 1000 Users to be held here April 26-28 is "Exploitation '83 — Getting the Most from Your Computer."

The UK RTE Users Group will host the conference under the sponsorship of the HP 1000 International Users Group, Inc. Attendees at the conference will deliver papers on topics such as data base management, microprogramming, graphics and data communications.

In addition, HP personnel will present seminars on the use of the HP 1000.

The cost for the conference is approximately $325. More information is available from the HP 1000 International Users Group, Suite 205, 289 S. San Antonio Road, Los Altos, Calif. 94022.

Service Association Selects Chairmen

SANFORD, Fla. — The North American Computer Service Association has selected committee chairmen for the group's Advisory Committee.

Chosen to serve on an interim basis were the following: nominating chairman, George F. Anderson, chairman of Systec, Inc.; publication chairman, Ellis Murphy, vice-president of Lurie-Murphy; and education chairman, Martin Schatz, dean of Rollins College.

Others chosen include the following: certification and training chairman, Brent Knight, president of Triton College; and finance chairman, David G. Glascock, managing director of Consultants Group.

The association is located at 110 W. Airport Blvd., Sanford, Fla. 32771.

Reorganized Air Traffic Controllers Still Vocal

By Marguerite Zientara
CW Staff

WASHINGTON, D.C. — Fired air traffic controllers do not just fade away when their union is decertified. They reorganize as a nonprofit corporation.

And just as the controllers have not faded away, neither have their complaints about the alleged problems that sent them out on an illegal strike more than a year ago [CW, Aug. 10, 1981].

The complaints among working controllers concerning pay, benefits, hours and an antiquated computer system remain, according to Mike Fermon, national treasurer of the U.S. Air Traffic Controllers Organization (Usatco), successor to the Professional Air Traffic Controllers Organization (Patco).

Usatco views the current state of air traffic control as a "problem that could be solved virtually overnight [by rehiring the 11,400 fired Patco controllers] ... especially at this point in our economic history," Fermon said. Incorporated last July, Usatco members "don't understand the [government's] point of not allowing those qualified to go back to the air traffic control system," according to Fermon, who cited the "money wasted in rebuilding the system, the reduced capacity and restrictions."

Fermon is one of a handful of former Patco officials who now administer Usatco, which claims about 1,600 dismissed controllers as members. Only "a couple dozen" of the members are working controllers who never went out on strike, Fermon said.

Since the strike, the Federal Aviation Administration (FAA) has "hired many new controllers and we're obviously not going to change our minds and rehire those who struck illegally," according to FAA spokesman John Leyden. "It's a dead issue and I think [the fired controllers] realize it's a dead issue."

Does Usatco feel the FAA's plans to replace air traffic control (ATC) computers — slated for installation between 1985 and 1987 — will improve the reliability of the ATC system? "Naturally, we're in favor of equipment improvements if they will accommodate the FAA's claims in terms of safety," Fermon said. "But if its greater reliance on machines results in a reduced number of people, they may sacrifice safety.

"There are a lot of things people can do that computers can't do," he added.

Fermon also charged that there will be a "deterioration of safety" as long as the FAA continues to operate at its poststrike reduced staffing level. "We are concerned that as time goes by, there will be fewer experienced controllers working as they leave to retire or because of dissatisfaction with working conditions," Fermon explained.

"Sure, there are not as many experienced controllers, but we're compensating for it by using different procedures," the FAA's Leyden countered. Citing extended flight separation distances and automated flow control methods, he said that the statistics for near-misses and operational errors are "better than before the strike."

A recent National Transportation Safety Board draft report, however, pointed out controller on-the-job training-related safety problems "require immediate, corrective action by the FAA" (see story below).

The Professional Airways Systems Specialists (Pass) corroborated a claim by Usatco that routine maintenance checks on ATC computer systems are often neglected. "We have heard complaints about that from people in the field," explained Pass Executive Vice-President Mark Schneider.

Acknowledging that Pass has no statistics on maintenance as compared with the pre-strike period, Schneider contended, "[Maintenance] is not as easy to do as it used to be. The problem now is that some controllers are reluctant to release their equipment for routine checks while they're on duty and we can't do the checks without their permission."

NTSB Calls Controller Shortage 'Stressful'

WASHINGTON, D.C. — Shortly after the firing of the 11,400 Professional Air Traffic Controllers Organization strikers in 1981, the National Transportation Safety Board (NTSB) issued a report warning that the reduced work force could cause controller stress and threaten safety [CW, Nov. 2, 1981].

Now, more than a year later, a recent NTSB draft report sent to Federal Aviation Administration (FAA) administrator J. Lynn Helms cites the "very stressful" situation regarding computer-based, on-the-job training of newly certified controllers.

The draft is a prelude to the NTSB's formal, overall report on "how the [air traffic control] system is being run," an NTSB spokesman said. That report is slated for release in March.

Before May 7, 1982, according to the NTSB, a controller assigned to conduct on-the-job training for a trainee controller was required first to receive FAA-approved instructor training. On May 7, 1982, however, the FAA waived that requirement for facilities "where resources prohibit administering appropriate training courses" until May 1, 1983, the draft

(Continued on Page 24)

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VSAM Performance Workshop/2 Days
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INVITATIONAL COMPUTER CONFERENCES

Systems Developer Credits Sales to Portable Terminals

WAYNE, Pa. — Portable terminals may not be the only reason why Bookkeeper Corp., a computer system developer, realized first-year revenues of over $500,000.

But they certainly helped, according to Bernard Klawans, the firm's founder and president.

The computer system developer firm used the terminals — made by Computer Devices, Inc. — to demonstrate its customized software programs onsite and establish a diverse client base of financial, medical, manufacturing and educational organizations.

The key to the company's success is reportedly its ability to create specialized data base management programs 20 to 100 times faster using its Dalamate II proprietary software language than using conventional Fortran.

Consequently, Bookkeeper can provide its customers with customized software packages at lower cost.

According to Klawans, a portable terminal is the best way for the firm's prospects to become aware of what its product could do.

Klawans' prior experience with Computer Devices terminals, while he managed a General Electric Co. data center, led him to choose the same equipment for his own company's use.

"The 15 Computer Devices terminals at GE were very reliable, and they held up under very rough treatment," he explained.

His experience with the terminals at Bookkeeper has been equally rewarding. "The only problem we've had in more than a year has been a missing washer which was replaced," he stated.

Moreover, the portable terminals are versatile, allowing Bookkeeper's analysts and staff to perform programming and general off-site maintenance at home.

The terminals feature bidirectional, whisper-quiet printing; multiple-column formatting; and high-resolution, dot-addressable graphics.

The terminals also feature a variety of communications options which include: store and forward, autodial, auto answerback, Bell 212 telephone modem and TWX and CRT terminal interfaces.

For greater versatility, the terminals can be equipped with CCITT-compatible modems in place of the standard Bell 103 or the Vadic Corp. 2400-type modems. The RJ11 connector facilitates direct connection to a telephone line.

Even more important, however, has been the tremendous impression the equipment has made on potential customers. One demonstration won Bookkeeper a popular local money market fund account. Another system demonstration resulted in a Pennsylvania school township contract for a complete turnkey operation to process school records, student attendance information, food service budgets, payroll, taxes, inventory, and accounts receivable and payable.

In fact, Bookkeeper has used the terminals to successfully bid for accounts with an Ivy League university, a brokerage firm, a specialized pharmaceutical wholesaler, a travel agency, several banks and a New Jersey school district.

The portable terminal is so popular with the company's prospective customers that it functions as a loaner as often as it does a demo unit.

"We don't hesitate to recommend the terminals to our customers who need such a tool," said Klawans.

NTSB: Shortage 'Stressful'

(Continued from Page 23)

noted.

NTSB's investigation found that "many facilities are using newly certified controllers to provide [on-the-job training] on both radar and non-radar control positions . . . before they have had time to develop either sufficient experience or 'seasoning' at that position or receive FAA-approved instructor training."

Furthermore, the report said, "In some instances, developmental controllers were certified on a position in the morning and were conducting [on-the-job training] at that same control position for another developmental controller in the afternoon of the same day."

Because the FAA Handbook requires on-the-job-training instructors to be "proficient" — defined as "highly skilled" — NTSB has recommended that the FAA "immediately cancel the waiver" and "reexamine its use of newly certified developmental controllers as [on-the-job-training] instructors."

In addition, the promise of extra pay for on-the-job-training instruction, the desire of senior controllers for a "return to a normal work week and vacation schedule" and management's desires to meet training goals have resulted in "extensive training periods," according to NTSB.

"As a result, many senior controllers are conducting [on-the-job-training] for 5 to 7 hours per shift, which the Safety Board has determined to be very stressful for the instructors and trainees in heavy work load situations," the draft indicated.

"Additionally, the extended hours of [on-the-job training] do not provide for a meaningful learning situation for the trainees," said the NTSB report.

The Board contended, "It is the responsibility of managers to recognize the adverse consequences of conducting protracted [on-the-job training] and to develop realistic methods of keeping the amount of [on-the-job training] required to be provided by controllers at an acceptable level."

In its investigation, the NTSB surveyed 50 air traffic control facilities, including 16 air route traffic control centers and 34 terminal radar and nonradar facilities, and interviewed about 350 facility managers, staff controllers, controller trainees and military controllers temporarily assigned to the FAA.

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How to Get Corporate Backing?

Q In the recent In-Depth series you authored on management information systems (MIS), "Long-Range MIS Planning" [CW, Aug. 2], you wrote in the first paragraph of the last part of the series, "MIS planning ... requires a commitment of support and cooperation from all corners and levels of corporate endeavor." How do you set the wheels of change in motion *without* corporate backing?

A great deal goes on in a corporate structure that defies analysis from the outside. It is all very well to say that the correct procedures are thus and so, but the real problem is how to implement the MIS function correctly when nobody really wants it that way — when departments ask your advice on word processing but don't take it; when upper management returns from peer-group meetings and tells us that we have more than they (which may be true, but isn't saying much).

As far as I can gather, the real problem is fear of change. Those of us who have been in the computer business for a number of years have become accustomed to change. When *we* see something better, we drop everything and hop to it. Not so with those classified as "users." When *they* see something better, it scares them. If we force a change on them, it is a threat to their job security and to their intelligence. "They" are everybody from the data-entry clerks to the president of the organization.

It would be much nicer to do things as you describe, but in a small organization like ours with political factors, it won't wash. In fact, I tried to inject a commitment to "plan" (that's all, just plan) for an upgrade of administrative computing facilities into the organization's "Long-Range Plan," and the response to "All in favor?" was deafening silence — just as I expected.

A In my MIS long-range planning methodology, I never promised you a rose garden. In my methodology, MIS long-range planning is the ultimate political, procedural and operational challenge. Even so, it can be done.

QA Turnaround Time By Larry E. Long

Q You, I and many others know that a good computer programmer may not make a good systems analyst, and vice versa, because these fields require different aptitudes. However, many do not appreciate this fact and this leads to job mismatching. For instance, the federal government has both fields in the same "Computer Specialist" classification series.

Do you know of any emplrical studies that point to the difference in aptitudes required for these two disciplines.

A If you, I and just about everybody else know that skills required for programmers are markedly different from those required for system analysts, why does the federal government not differentiate between the two, and why do the majority of data processing departments have career development programs that encourage programmers to become analysts?

To my knowledge, no empirical studies have been conducted on this topic. A study is not needed to prove the obvious. What *is* needed is a reassessment and extention of the programmer career path. It is a crime to force some good programmers to become bad analysts.

Q I recently retired from the military. To prepare for that time, I earned two B.S. degrees in business and data processing and an M.A. in management. I have accepted a systems analyst trainee position with a progressive oil company.

I want to continne my education. My first thought was a master's degree in computer science, but now, however, I am not too sure. My personal preference is in the management field.

What type of schoolling would you snggest?

A You have two bachelor's and a master's. Another master's degree will be of marginal value. Your best bet is to pursue continuing education in specific job-related skills.

Ask your supervisor what skills will be required during the training period. Direct your educational efforts toward acquiring these skills. This will accelerate your experience and, therefore, your progress toward management.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.

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Transit System Goes On-Line, Now on Time

SAN FRANCISCO — The San Francisco Bay Area Rapid Transit (Bart) system is the most computerized transit property in the U.S., as well as one of the most financially stable.

"We think computers played a major part in this success," said Thomas R. Sheehan, head of information systems for Bart. Bart "is capital intensive, and virtually everything we do here has DP implications," Sheehan added.

"This orientation leads to extensive use of computers in nearly all Bart activities," he noted. And computers have contributed to a steady improvement in system reliability as well as in performance.

On-Time Record Climbs

In 1981, Bart's "on-time" record climbed to 94.2% and volumes increased to more than 50 million patrons. By the end of the year, Bart had carried 300 million people, for a total of more than 3.9 billion passenger-miles since service began operation in 1972, according to Sheehan.

Furthermore, Bart currently costs 15½ cents per passenger-mile, less than half the operating cost for typical automobile travel in the San Francisco area. Bart pays almost half of its costs from the fare box, a percentage that continues to increase. Moreover, Sheehan continued, Bart has held the line on labor costs.

Computerized Wayside and Central Control operate the trains right down to every door opening and closing via sensors in the tracks, Sheehan explained. Computers also schedule the trains, oversee the automated ticket machines and monitor the turnstiles. They also help perform the more traditional back-office bookkeeping functions.

There is a small computer in each of the 34 stations to drive electronic information signs. Wayside and Central Control backup systems assure a level of operating safety never before achieved, while holding manpower needs to a minimum.

Bart has more than 150 small computers doing specialized functions. An IBM 4341 processor with 4M bytes of memory, however, is Bart's largest and most heavily used system.

Installed in 1981 to replace aging Sperry Univac 7046 and Honeywell, Inc. 6020 machines, it manages a long list of applications, including a financial management system, specific segments for funds commitment, accounts payable and labor management and scheduling.

Other applications are traffic flow and revenue information by station, materials management, labor distribution and a maintenance and reliability information system — the largest single application. The Materials Management System runs under Communications Oriented Production Information Control System, an IBM application program.

System Monitoring

Since the 4341 receives information passed along by the smaller processor that controls the train schedules, Bart has come up with a real-time system-monitoring program. Using IBM 3279 color video terminals and the Graphical Data Display Manager, the Train Information System displays the current location and status of every train in two formats.

A table-oriented format enables a Bart employee to announce arrival and departure information at every station. The other format is a "moving train scenario" that lets the viewer see the actual location of each train, shown as an arrow, superimposed on a route map programmed onto the screen.

The arrows are color coded to indicate a particular origin/destination combination. The locations are updated every 16 seconds.

"This is absolutely a first," said Sheehan. "It gives us both a statistical and a graphic representation of the entire route. Someday we may be able to install these moving scenarios at every station so the passenger will know when to expect the next train."

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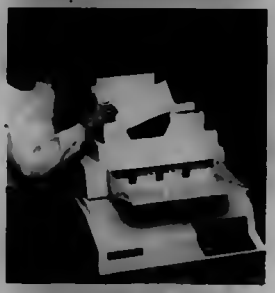

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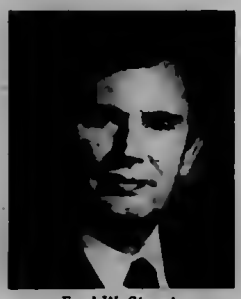
Managers on the Move



Fred W. Stuart

FRED W. STUART has been appointed director of corporate information services for Phelps Dodge Corp. in Phoenix. He will assume responsibility for the company's eastern and western regional data centers and the direction of data processing, communications, word processing and related activities throughout the corporation.

Stuart joined Western Nuclear, Inc., a wholly owned subsidiary of Phelps Dodge, as director of data processing. In April 1981, he was named director of information resource management-West.

He received a bachelor's degree in finance from the University of Cologne in West Germany.

•••

JAMES E. STANIFORTH has been named vice-president of information services and JAMES S. SARNOVSKY has been appointed director of information services/sales for the Fruehauf Division of Fruehauf Corp. in Detroit, a supplier of equipment and services for the truck-trailers, automotive, maritime and aerospace industries.

Staniforth will direct the planning and development of Fruehauf Division's information systems and Sarnovsky will direct the development of information systems for the division's sales activities.

Staniforth has served as director of management information services for Fruehauf Corp. since 1975. Prior to that, he held various positions including manager of computer technology. Staniforth holds a B.S. degree from Loyola University and an MBA degree from the University of Michigan.

Sarnovsky most recently served Fruehauf Corp.'s management information systems (MIS) department as manager of systems development. Prior to that he served as manager of computer technology for Fruehauf and also as data base administrator for Kelsey-Hayes, a Fruehauf subsidiary.

Sarnovsky earned a B.S. degree from Lawrence Institute of Technology and an MBA degree from Eastern Michigan University.

•••

HUGH V. NAUGHTON has been named manager of office information systems for Firestone Tire & Rubber Co. in Akron, Ohio. Naughton is responsible for directing the design and implementation of office information systems throughout Firestone and the integration of these systems with data processing and communications systems.

Previously, Naughton spent four years with the Arlington, Va., firm of Betace Corp., providing MIS consulting services to the Department of Defense. Prior to that he was a career U.S. Army officer specializing in

James E. Staniforth

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Managers on the Move

DP management and analysis.

He has a bachelor's degree from DePaul University and an MBA degree in data processing and personnel management from George Washington University.

•••

DONALD J. BROWN has been elected vice-president of information and communications systems for Perini Corp., a construction, real estate and coal mining firm headquarted in Framingham, Mass.

Brown joined Perini in 1973 as manager of corporate data processing after working for Commercial Information Corp. and Wang Computer Services.

He graduated from Clarkson College of Technology.

•••

MICHEL VITIELLO has been appointed director of international systems of United Technolgies' Inmont Corp., a producer of printing inks and automobile paint headquartered in Clifton, N.J.

Vitiello was previously vice-president of management information services at Church's Lumber Yard in Utica, Mich.

Vitiello holds a French baccalaureate in philosophy from the University of Montpellier in France. He also received both a B.A. degree in psychology and an M.B.A. degree in management from Oakland University, Rochester, Mich.

•••

JAMES C. MILLER has been promoted to the position of Transition Project Manager in James River Corp.'s corporate MIS department in Richmond, Va.

Previously, Miller had been associate director of systems support in the company's Dixie/Northern Information Services Department in Greenwich, Conn.

He earned a B.S. in accounting from Penn State University, an M.S. degree in computer science from Rensselaer Polytechnic Institute and an MBA in finance from the University of New Haven.

•••

JOHN P. SULLIVAN has been appointed manager of data processing operations for the Communications Information Services Division of Wakefern Food Corp. in Elizabeth, N.J. He will be responsible for all data processing operations including data entry, distribution, data control, scheduling and communications.

Prior to joining Wakefern, Sullivan was computer operation manager at Mutual Benefit Life.

He attended Brookdale College and Rutgers University.

Donald J. Brown

Michel Vitiello

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Warehouse Firm Racks Up Profits, Saves With System

GREENVILLE, S.C. — A 33% increase in productivity and an annual savings of $60,000 in DP costs has accrued from the use of specialized manufacturing software by one of the country's largest makers of custom rack storage systems.

The privately held Engineered Products (EP) specializes in custom-designed automated warehouses. Typically, they are 80 feet tall, occupy 40,000 square feet and store about 14,000 pallets. Storage and retrieval is performed entirely by machine.

Users include both Fortune 500 companies and smaller, regional concerns, ranging across industries as diverse as apparel, electronics and farm equipment. EP's other lines are conventional custom racks, rack and conveyor systems for the textile industry, nuclear fuel storage racks and cable trays. About 300 people work in the firm's three plants.

Before computerizing four years ago, the metal fabricator relied chiefly on manual methods supported by an in-house system running a labor-tracking application and a time-sharing service used for engineering computations.

At that time, large jobs open for long periods were susceptible to inaccurate charges, with the result that the difference between year-end physical inventory and the inventory on record once went as high as $400,000.

The terminal located on Engineered Products' plant floor lets the foreman track the manufacturing process and prevent problems before they occur.

The decision to computerize came out of an 80% annual growth rate, which necessitated more efficient managerial control. The distant location of some acquisitions underscored this need.

After a seven-month study of several major vendors — including IBM, Datapoint Corp., Digital Equipment Corp., and Hewlett-Packard Co. — EP decided on the HP 3000 system, recalled Software Contract Manager Mark Kaiser. The decision was influenced by benchmark studies conducted by Furman University here.

HP was selected because of its Image/Query data base management system, its on-line capability and the reliability of its hardware, Kaiser said. The system has enabled the company to cut manufacturing lead time from about 10 weeks to seven, increase shop floor activity by one-third, boost throughput in production engineering by 25% and triple the estimating department's output.

Transferring engineering computations to an in-house system resulted in a $60,000 annual savings. Automation also cut the difference between year-end physical inventory and inventory on record to $1,200, Kaiser pointed out.

The system permits greater involvement in production control at lower supervisory levels. "For instance, EP's shop foremen are now able to monitor the production levels of their crews on a shift basis, which means they can take corrective action before periodic reports are released to upper management," Kaiser said.

The result is an increase in both productivity and employee satisfaction, since foremen are rewarded with bonuses.

EP's system consists of interconnecting an HP 3000 Series III and a Series 44. The 1M-byte Series III is configured with two HP 7925 120M-byte disk drives, one 7970 tape drive, a 200-line/min 2607 printer and 34 terminals.

The terminals — HP Models 2640, 2642 and 2622 — are located in functional areas such as shop foremen's booths on the manufacturing floor.

The Series III is used for production, while the Series 44 — located in a 25-person DP office — is used chiefly for software development, as well as engineering computations. The Series 44 is configured with one 7925 120M-byte disk drive, a 400-line/min printer and nine terminals.

The company has developed its own software package, EP/3000, to meet the needs of job-shop manufacturers.

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Control Package Helps Ski Manufacturer Glide

SEATTLE — A manufacturing control package is keeping production gliding smoothly here at one of the world's largest makers of skis:

Since the K2 Corp. installed NCA Corp.'s Maxcim/Manufacturing system in June 1980, inventory accuracy has increased dramatically, a spokesman said.

K2 is not a newcomer to computer-assisted operations. The company has had in-house hardware since 1974. "We had most of our financial system in place prior to the NCA system installation," said John McGaughey, the company's data processing manager. "It was custom software that we'd written ourselves."

Although his staff of two senior programmer/analysts and an operations supervisor had written some limited manufacturing resource planning (MRP) software, McGaughey said, "it just wasn't filling our needs. We needed a complete manufacturing system from master schedules through requirements planning, and we just didn't have the manpower or the time to do it ourselves."

Integration Without Change

K2 began looking for suppliers of MRP software that would be compatible with their Digital Equipment Corp. hardware and homegrown financial software. "We looked at a number of suppliers," McGaughey noted. "NCA's Maxcim/Manufacturing system impressed us most. We wanted to integrate it with our existing financial system, without major changes to either. NCA's system lent itself to this and NCA offered training that would allow us to do it."

K2 bought the manufacturing system and the accounts payable module from the Maxcim/Financial system and set up a five-person implementation team. The team consisted of representatives from production control, data processing, accounting, production and engineering, McGaughey said.

The team took a week-long NCA training course, while K2 sent two programmer/analysts to NCA for an in-depth technical seminar on the workings of NCA's FMS data base, the foundation for NCA software.

The programmers were charged with writing interfaces to K2's existing financial software. "We needed to know the workings of FMS to extract what we needed from the software," McGaughey said. "We didn't have to modify the NCA software at all. We did some 'exterior' work — for example, letting our general ledger feed from all necessary places in the system."

The company installed the manufacturing system gradually, bringing in first the inventory, then bill of materials, purchasing and accounts payable modules. Then the work order module was brought up in a pilot production area. The rest followed in a "natural sequence," McGaughey said.

Installing the NCA system "most definitely" required a change in the company's management techniques, he added. "After all, our prior computer controls were pretty much a localized function, with financial software accessed by accounting and financial people. No one else really needed it."

The implementation team helped expand the system to include users at many different levels. "The combined system has some 40 terminals with most control from the manufacturing side," McGaughey said.

The prime benefit of the manufacturing system has been control, the DP manager added, an advantage that required a change in management style. "We actually rearranged our shop," he said. "We use a controlled-stores approach now. When an operation is finished, the goods move into the controlled store and they must be checked out of that store before they can proceed to the next operation." With that new level of control available, McGaughey said, "it's now much easier for us to react — to increase a run of skis, for example, or even to stop a run when we know what we really have."

McGaughey offered a concrete example: "Take our inventory. It had been running at about 65% to 70% accuracy. Now it's running more than 90%. The higher the accuracy, the more materials savings we have. And that's like dollars in our pocket."

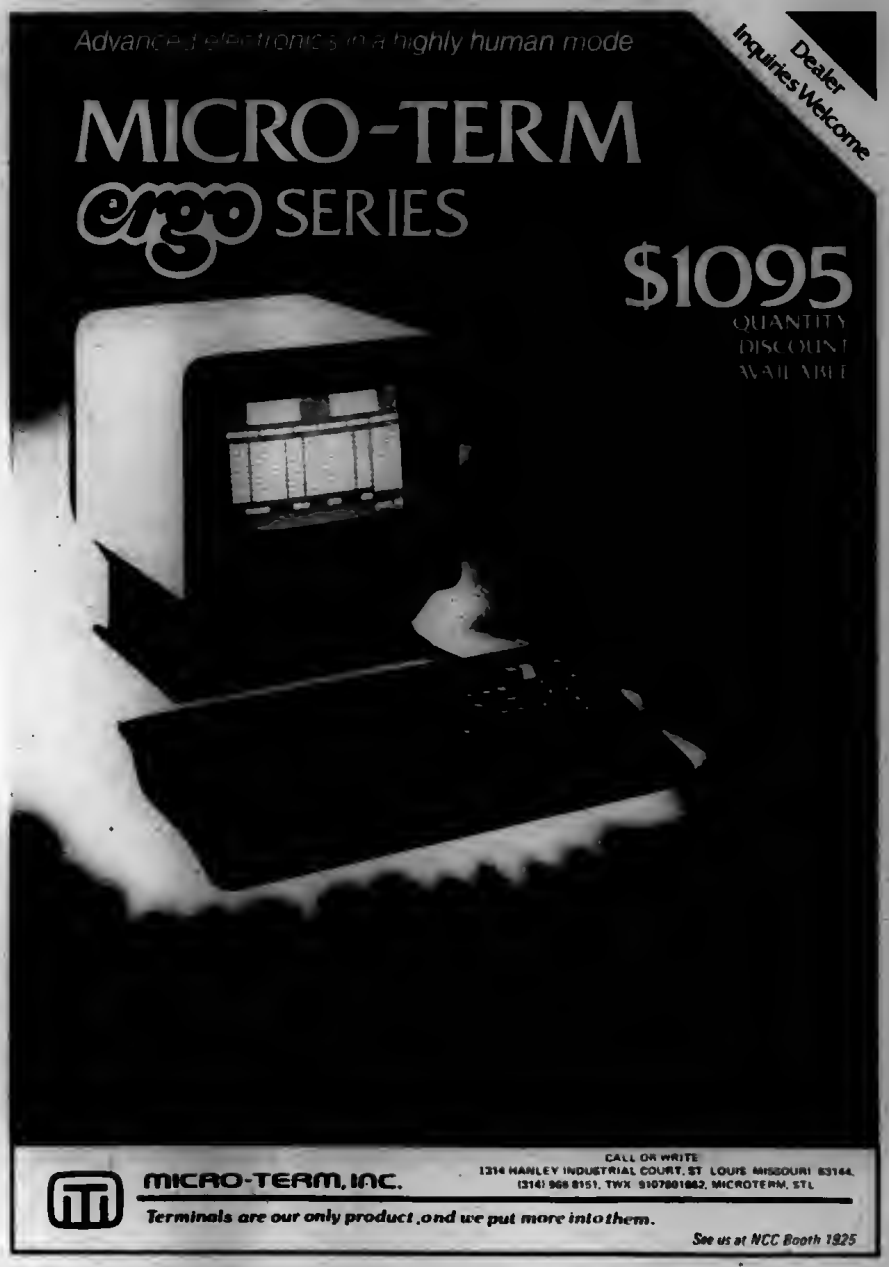
Seminars Scheduled On Communications

ORANGE, Calif. — A series of three-day seminars entitled "Data Communications Systems, A Practical Guide" will be offered in Canada by the Center for Advanced Professional Education, Inc. (Cape).

Major topics to be covered include: carriers and regulations, media, network elements, modems and modulation, modes of operation, codes, interfaces, protocols, message format requirements, hardware, transmission integrity, network transaction and application types, system design considerations, synchronous vs. asynchronous and operation alternatives for users.

Canadian locations and dates are: Montreal, Jan. 19-21; Toronto, Jan. 24-26; Calgary, Feb. 9-11; and Ottawa, Feb. 16-18.

Registration fee and course workbook is $695 from Cape at 11928 N. Earlham, Orange, Calif. 92669.



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Tech Causing Uncertainty Among MIS Execs: Professor

By Jeffry Beeler
CW West Coast Bureau

LOS ANGELES — Managers of business information systems have entered a period of "extraordinary change" characterized by a convergence of formerly discrete technologies, according to Dr. Richard Byrne, who teaches at the University of Southern California's Annenberg School of Communication.

This convergence, in turn, has plunged management information systems executives into an era of "unprecedented uncertainty," Byrne explained during a recent interview.

Until just a few years ago, all the available electronic media for storing, processing and disseminating information held little relevance for each other. "Television was television and computers were computers, and neither side ever talked to the other," Byrne said.

But today, all the formerly separate electronic technologies are "blending together," he added, and "absolutely no one knows how all the pieces will eventually go together. A lot of people who used to be very competent and confident aren't any more."

One of the most significant of today's converging technologies is commercially oriented personal computers, that are causing a basic, "structural" change in information management and in the "business of doing business," Byrne said.

Although traditional, highly centralized DP is unlikely to fade from the scene anytime during the foreseeable future, the process of managing corporate information will have to be revised to take into account individual variances in user creativity.

"There may not be one system protocol that applies equally to everybody," Byrne said. "We may have to handle individual variances in a way that would have been counterproductive a few years ago."

Byrne — who also serves as an associate with Mill Valley, Calif.-based American Consulting and Training, Inc. — disagrees with big-company DP managers who regard commercial microcomputers as a "fad, a joke, a mere blip on the radar screen." Computing professionals who think that way are overlooking personal computing's networking potential and its ability to force companies to redefine what information should be controlled, released and coordinated, he said.

Byrne's comments came shortly before he was scheduled to appear as the featured speaker at a meeting of the Data Administration Management Association (Dama). The meeting, which took place aboard the *Queen Mary* last month in nearby Long Beach, Calif., marked Dama's first anniversary as a users group.

Despite their potential to trigger profound corporate and information-management changes, personal computers still face some serious obstacles to their effective implementation. One of those barriers is fear of technology.

"DP managers fear the new technology because they think that executives will demand access to information that will corrupt and pollute their companies' data bases," Byrne said.

To cope with their misgivings about micros, DP managers have only one truly effective course of action available to them: to learn as much about the very small machines as they can, Byrne said.

Byrne also urged DP managers to abandon many of their preconceived ideas about how corporate information management should work, especially the cherished notion that centralized, tightly controlled computing departments will remain the core of business decision making.

FOR THE INFORMATION CENTER

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Calendar

Week of Feb. 6

Feb 7-10, Philadelphia — **Computer Auditing.** Contact: Information System Resources, Inc., 144 Balsam St., St Paul, Minn. 55122.

Feb 9-11, Washington, D.C. — **Advanced Business Communications Networks.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C 22052.

Week of Feb. 13

Feb 14-16, Washington, D.C. — **Selecting Small Computers for Government and Business.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Feb. 14-16, Washington, D.C. — **Facilities for Auditing IBM's OS/VS Operating Systems.** Contact: Marge Cohen, Registrar, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

Feb. 14-16, Washington, D.C. — **Auditing & Security Concepts for IBM's MVS Operating System.** Contact: Marge Cohen, Registrar, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

Feb. 14-16, Washington, D.C. — **Auditing & Control Concepts for IMS.** Contact: Marge Cohen, Registrar, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

Feb. 14-16, Summit, N.J. — **Job Control Language.** Contact: Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

Feb. 14-16, Summit, N.J. — **MVS Dump Debugging.** Contact: Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

Feb. 17-18, Washington, D.C. — **Auditing Cobol Application Programs.** Contact: Marge Cohen, Registrar, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

Week of Feb. 20

Feb 21-25, Chicago — **Structured Design and Programming.** Contact: Predictable Systems, Inc., Suite 825, 39 S. LaSalle St., Chicago, Ill. 60603.

Feb 22-24, Summit, N.J. — **Vsam in Cobol.** Contact: Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

Feb. 25-26, Teaneck, N.J. — **Strategic Planning for Information Systems.** Contact: Priscilla Goudreault, Education Coordinator, Q.E.D. Information Sciences, Inc., 180 Linden St., P.O. Box 181, Wellesley, Mass. 02181.

Feb. 25-26, Atlanta — **Advanced Program Control Techniques.** Contact: Technical Marketing Society of America, 59959 W. Century Blvd., Los Angeles, Calif. 90009.

Week of Feb. 27

Feb. 28-March 1, Atlanta — **Using Small Computers in Government.** Contact: U.S. Professional Development Institute, 12611 Davan Drive, Silver Spring, Md. 20904.

Feb. 28-March 2, Houston — **DP Disaster Recovery Seminar.** Contact: DP Security, 181 West St., Waltham, Mass. 02154.

March 1-3, Boston — **Data Analysis.** Contact: Priscilla Goudreault, Education Coordinator, Q.E.D. Information Sciences, Inc., 180 Linden St., P.O. Box 181, Wellesley, Mass. 02181.

March 1-3, Washington, D.C. — **Software Project Development.** Contact: George Washington University, Continuing Engineering Education, Washington, D.C. 20052.

March 2-3, Atlanta — **Developing Small Computer Applications in Government.** Contact: U.S. Professional Development Institute, 12611 Davan Drive, Silver Spring, Md. 20904.

March 4-5, Providence, R.I. — **Conference on Computer Technology: The Challenge to Business and Industry.** Contact: Conference on Computer Technology, Registration Office, Association Internationale des Etudiants en Sciences Economiques et Commerciales, Box 1930, Brown University, Providence, R.I. 02912.

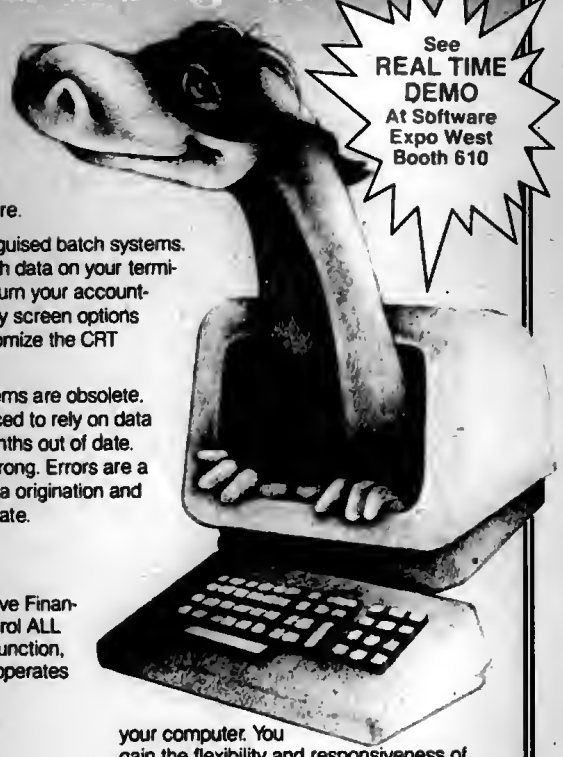
Week of March 6

March 7-10, Chicago — **Systematic Software Design.** Contact: Eduteach, Inc., Suite 907, 162 N. State St., Chicago, Ill. 60601.

March 7-11, San Francisco — **MRP II: Manufacturing Resource Planning.** Contact: Walter E. Goddard, President, P.O. Box 313, Newbury, N.H. 03255.

March 7-11, Dallas — **Assets Protection Course.** Contact: American Society for Industrial Security, 2000 K St., Washington, D.C. 20006.

Real Time Financial Software Or A Dinosaur In Disguise?



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Try finding an ad for financial software without a photo of a CRT terminal. It's almost impossible. Incredibly, behind most of these terminals lurks an outdated batch system. Disguised with a few "online" add-ons to *look* like real time software.

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CTG Video Course Targets Unix Users

CHICAGO — The Computer Technology Group (CTG) of Telemedia, Inc. has announced a video training course for people interested in learning more about Bell Laboratories, Inc.'s Unix operating system.

"Unix Overview" consists of six units: an introduction; files, data base and data communication; Unix commands; the shell; programmers workbench; and Unix security and "C." The course is aimed at people who use Unix as an application development tool or who work with Unix-based applications.

The entire course costs $2100. Telemedia's CTG is located at 310 S. Michigan Ave., Chicago, Ill. 60504.

Researchers Tackling Football Injuries With DP

CHICAGO — Although most football injuries are minor, nearly 200 players over the last decade have suffered permanent paralysis or brain damage despite being swathed in seemingly sturdy equipment. Finding out whether equipment can be designed to shield players from tackles carrying a force of 5,000 pounds and just how much of that force can be safely absorbed is the basis for a study here involving a team of researchers from the Illinois Institute of Technology (IIT).

A three-man team led by Ray Vanderby Jr., an assistant professor of mechnical engineering, is using computer technology to find out exactly what happens during a head or spinal injury — for, example, the number of pounds of force it takes to break a man's neck.

Eventually, research results should point toward the type of material properties needed to strengthen a helmet to prevent or minimize injuries, Vanderby said. To compile data, the trio uses IIT's Prime Computer, Inc. Prime 400 minicomputer running on the vendor's Primos operating system and Tektronix, Inc.'s Plot 10 graphics and terminals.

To obtain data, the researchers view game films in which an injury has occurred and project the film, frame by frame, onto a digitizer to digitize the positions of the players during the incident. With the players' physical statistics, positioning and film speed, Vanderby can get a good estimate of the positioning, velocity and acceleration at the moment of impact.

The results are displayed on a series of graphs which show the force in pounds that the player absorbs at points of his body and points in time. The computer also produces a series of drawings that show the relative positions of the players at intervals of one-hundredth of a second — much faster than is recorded on game films.

Vanderby's team has collected data on various helmet types, using an on-line data acquisition microprocessor with a loading frame to gather mechanical parameters such as force vs displacement and energy absorbed vs. time. With this information, the researchers can recreate a situation alternating helmet types and material properties to compare player response and extent of injury sustained.

Past Experiments

In the past, similar experiments were carried out either using humans at low impact levels, cadavers or animals. "but all fell short of finding out how live humans get injured," Vanderby commented.

The researchers spent a year, mostly part-time, developing their own software, which included a Fortran program, a data base system for storing information and an interactive plotting program to draw figures. Although they had 90% of the software up and running in three months, they spent the rest of the year trying to make the remaining 10% "more user-oriented."

Vanderby foresees the possibility of the study's results being used to point out more graphically to National Football League officials the risks involved in various situations. This, in turn, could be used to force strict enforcement of current rules.

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EDITORIAL

Think Twice

The ruling in the IBM vs. Bridge Technology, Inc. civil suit [CW, Dec. 6] has become a hot topic of conversation in some legal circles. According to one New York lawyer who specializes in trade secret litigation, the broad language of the consent order and permanent injunction issued in that ruling as it defines "trade secrets" could prevent the defendants from ever working in the computer industry again.

The ruling was the outcome of a lawsuit that IBM filed in September against Lewis Eggebrecht and Peter J. Stearns, two former IBM senior engineers, and a third former IBM employee, William W. Erdman. The three had formed Bridge Technology in order to market products in the IBM marketplace; IBM charged them with attempting "to sell design information relating to unannounced IBM products in the personal computer field."

Moreover, IBM feared that the trio's knowledge of IBM's Personal Computer designs and strategies would give the start-up company an unfair advantage and thereby sap IBM profits in this market.

The case ended with a permanent injunction barring Eggebrecht and Stearns from revealing or using any IBM trade secrets or confidential information and prohibiting them for three years from designing, developing, manufacturing or marketing computer products relying in any way upon trade secrets or proprietary information.

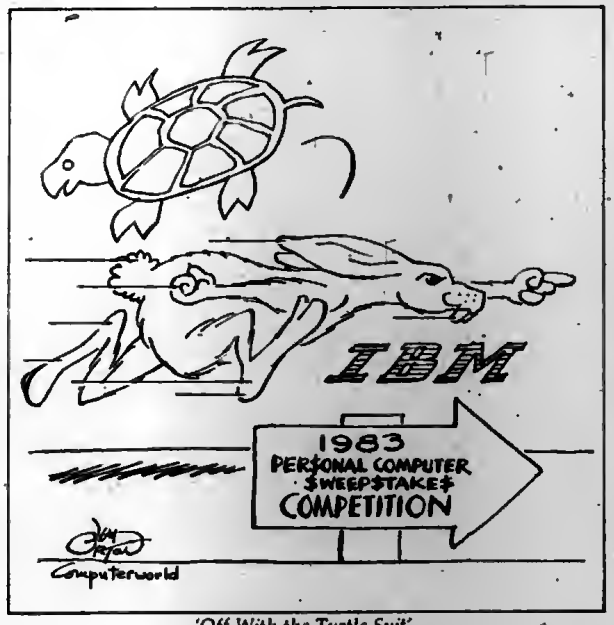
Current debate about the ruling centers around the definition of "trade secrets" and "proprietary information." The injunction defines them as including "all ideas, inventions or designs related to or suggested by ... IBM" and "information that has not been publicly disclosed by IBM."

That definition is "extremely broad," said trade secrets expert and attorney Alvin Stein of Parker, Chapin, Flattau and Klimpl. "It seems as if the defendants are excluded from the field of IBM [products]. I really question how these people can do anything without going afoul of this agreement," he said in a recent interview. IBM itself would not comment on the ruling's relative harshness or leniency.

There are two possible reasons why the defendants opted for settling on such unfavorable terms in the decree, Stein said. "One is that they were caught red-handed and IBM had such a strong case" that the defendants believed they could not do any better. Secondly, "the defendants may not have been able to bear the cost of litigation."

Some observers believe IBM wielded a pretty big stick in this matter, using its extensive resources to squelch the three defendants' admittedly damaging efforts. This — combined with the computer giant's recent snaring of two major Japanese companies last year in a trade secrets buy-off — indicates that the company is cracking down on those that would steal the crumbs off the IBM banquet table.

So the real message in the verdict is that IBM is ready to make examples of those close to the company with higher ambitions. Both established and start-up companies will have to think twice before deciding to tackle a market in which IBM already has a presence.



'Off With the Turtle Suit'

LETTERS

Entry-Level Problems

During the past year I have discussed the shortage of skilled programmers and programmer/analysts with at least 50 different senior DP executives. All of them have had difficulty recruiting and/or retaining experienced personnel.

College and technical school graduates with one or two years of experience have been in short supply as long as I can remember. At least 50% of the executives with whom I spoke stated that they never hire new graduates. Instead, they recruit people with one or two years of experience.

Granted these random conversations cannot pass any test of sampling techniques or statistically reliable analysis. Nevertheless, I am convinced that companies that refuse to hire new college or technical school graduates are the major cause of the shortage of experienced DP professionals.

I frequently read that universities and technical schools are not educating enough programmers. If this is true, why is my file overflowing with resumes of highly qualified recent graduates?

If you are part of the problem, please get busy and become part of the solution. If your company is part of the problem, and you have no control, please resolve to become part of the solution if it is ever within your power.

It is not easy to run an effective training program that can develop new graduates into productive professionals. As a matter of fact, I don't know anyone except some major accounting/consulting firms who feel they do a good job in this area.

Fortunately, the quality of today's graduates is such that we don't have to do a good job. It is enough to give them a desk and assign them to assist a senior staff member. Of course it would be better to have a comprehensive plan for developing these people.

However, if the choice is between poor training and not providing any entry-level positions, I believe it is preferable to provide the positions.

Certainly the shortage of skilled people will persist until there is an adequate number of entry-level positions to provide for the growth that we continue to experience.

We must either provide the entry-level positions or continue to be faced five years from now with the same project delays, due to lack of experienced staff, which we are facing today.

A.W. Holtsberry
Westerville, Ohio

..And Hiring Techniques

"Mitre Offering List of DP Jobs Via At-Home Dial-Up Service" [CW, Dec. 10] might have noted that dozens of Mitre Corp.'s progressive competitors in the New England job market have been supporting a much more comprehensive service since last fall. Called Connexions, this service is already national in scope and, at $600 per position posted, including all candidate promotion, is more effective than any in-house system could be.

Far from being the "cute gimmick" that the recruitment firm executive in the article labeled it, this approach puts dignity, confidentiality and efficiency into a chaotic job market that otherwise continues to hamper corporate recruiters and candidates with 19th century techniques.

At a time when access to highly qualified candidates is critical and personal computers nearly universally accessible, this cost-effective approach is merely inevitable.

Robert J. Kvaal
President
Connexions
Cambridge, Mass.

SOFTLINE /Werner L. Frank‡

Schemes for a Natural-Language Syntax

In previously published columns of this series, we have examined alternative application development schemes that were based upon language syntax having algorithmic specification form and ordered statements as the underlying approach. In this last column of the series, we describe the area where most attention is now focused: the use of natural language. The table of alternatives presented here is necessarily sparse in entries.

What makes a language natural English vs. English-like? The "almost English" claims have already been cited as attributes of the ordered statement systems discussed in "Ordered Statement, Directed Prompt Schemes" [CW, Dec. 20]. Perhaps the line of demarcation can only be clarified with examples.

A leading contender for a natural-language capability is Intellect of Artificial intelligence Corp. Intellect analyzes an English-language query, resolves ambiguities through a prompted dialogue, displays the interpretation of the query and, if acceptable, responds to the final retrieval step and generates the output.

Intellect is deemed an application generator and assigned to position (3,2,2). It is not an integrated solution system because it only facilitates retrieval. The data base will have been generated by some other program, and the special loader utility will incorporate such data under Intellect.

A key to understanding natural-language processing as distinct from a more formatted approach is the extension of the indexing feature common to data bases. In order to broaden the understanding of an English sentence relative to a specific data base, it is necessary to enhance the conventional indexing scheme by a supporting system. This system provides additional meaning to possible words used relative to the data base. For example, if the data involves personnel, then the following synonyms might be appropriate: employee, people, anyone, everyone, personnel, person, everybody, anybody.

Thus, Intellect can be expected to accept and process the following queries with equal ease:

- Print the name of all employees with the name Jones.
- Is anyone's name Jones?
- How many people are there with the name Jones?

Navy Application

An application-oriented natural-language system is the Programmed Language-Based Enquiry System (Planes), shown in the table at point (3,3,2). This system, developed at the University of Illinois, is aimed at supporting the data base needs of U.S. Navy aircraft maintenance and flight information. Planes includes an English-language front end capable of understanding user requests with the ability to carry on clarifying dialogues. The system is also geared to answering vague or poorly defined questions. Planes can handle query requests such as the following:

1. Which aircraft had engine damage in May 1973?
2. Did any planes that had engine maintenance in May have 10 or fewer flight hours in June?
3. What types of aircraft are there?

The first question is a standard type of request that could be asked in any system, though not in the natural form presented here. The second request is a complex statement that involves a good number of interrelationships and cannot be handled by the typical menu-driven or prompting query systems. The third question is general and solicits information about the content of a data base. This facility is not typically available in any other system.

Integrated Solution	303	313	323	333
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Ad Hoc Aids	300	310	320	TELLAGRAF 330
	Assembler	Compiler	Symbolic/ Function	Application

Implementation Schemes for Natural Language Syntax

The third example is Tellagraf of Integrated Software Systems Corp. Tellagraf is a conversational computer graphics system that allows the use of natural English to express directives generating graphics output. It is assigned location (3,3,0). To illustrate, all of the following statements assign "millions" to the Y-axis label:

- Y-axis label is "millions."
- Label the Y-axis "millions."
- "Millions" is the Y-axis label.
- The Y-label is "millions."
- Put "millions" on Y.

Natural-language systems of the type described here are "natural" with respect to query only. Defining and generating the data base, developing the indexing system and the semantic extenders are specialized requirements that still depend upon more conventional programming techniques.

This survey leaves acknowledged gaps in the array of alternatives for natural-language systems. This reflects, of course, the state of today's technology.

What may prove to be even more exciting is natural-voice input. Limited-vocabulary systems with this capability are now in an early prototype state. Systems useful for business purposes, however, may not reach the market until the early 1990s.

Werner L. Frank is an independent consultant and president of the W. L. Frank Computer Group located in Calabasas, Calif.

HUMAN CONNECTION /Jack Stone‡

A Few Words From DP's Future Rank and File

This is the first article in a six-part series, "Computers and the Collegians," co-authored with Joanne Barker.

They're not too knowledgeable about our blissfully remote, mysterious, challenging and complex universe of data processing, but bless 'em, collegians sure are eloquent about it.

We recently interviewed several seniors from the current crop to obtain their opinions about computers and found it a totally refreshing experience, so much so that we decided to share our findings on the views of the future rank and file of the industry in this new series of six articles.

The three we talked with are not intended to be a scientifically chosen sample; they were all we could crowbar away from anointed rounds of boisterous holiday parties. Our enticement of implied notoriety from a *Computerworld* write-up wasn't all that appealing, but the offer of some hot rum toddies before a roaring fire at an ocean beach house was.

We can't prove that our subjects were any more worldly wise than others, but if they were in any way representative, we have to say that seniors these days are delightfully charming, terribly honest and openly expressive. Their views were both fascinating and enlightening and covered the broadest range of subjects:

- The impending hunt for computer-oriented jobs.
- The quality of computer science courses at their institutions and their relationships with DP centers and how these organizations affected their perspectives of the industry.
- The effectiveness of the DP career counseling programs.
- Alternatives to a four-year degree for development machine skills.

According to Pearl Marshall, an A-minus student and computer science major at a small private college, "During my first two years, my career goal was in the veterinary sciences, but my first exposure to a Digital Equipment Corp. VAX-11/750 in my junior year abruptly changed my mind. I knew then I was destined for a DP career because I felt I could conquer the machines and use their tremendous assets for my benefit.

"But I'm surprised there has been no discernible effort on the part of the school, my instructors or industry recruiters to encourage me, or others in my department, in this direction, despite the presumably great needs for people with my skills."

Bob Stewart, a C-average student majoring in philosophy at a private college, said "I am fully aware of the desirability of a DP background, so I planned ahead for a computer science minor. However, I had such poor experiences with my first two courses in the field — computer basics and microprocessing — that I flat out dropped the idea.

"Compared with the dozens of others I've taken over the past three years, those courses were terribly disorganized. I suppose it's partly due to the fact that our school just started the curriculum last year. But that doesn't excuse one instructor from both admitting to the class that he was 'sidewinded' into teaching it and from doing a 'rotten job' with the first exam. And there was no justification for a textbook that was irrelevant to the lecture material."

Tony Charles, a senior, B-plus student and business major at a large state university, explained "Computers were not a mystery to me because I had plenty of 'hands-on' with my father's micro. So I expected to do well with an introductory course in Fortran. Boy, was that ever a total disaster!

"There were nearly 200 students in the lecture sessions, the instructor was awful, machine access was ridiculous, the textbook was incomprehensible and the teaching assistants were foreigners who couldn't easily explain how to write the programs. I was forced to cheat by submitting debugged programs I acquired from friends.

"If my experience is any guide, the industry will lose a lot of talent unless the educational establishment gets its data processing act together."

READER COMMENTARY/Stuart Scott

How to Sit Through a Six-Hour Seminar

When I was in grade school, I looked forward eagerly to what we called assemblies. The whole school would gather in the gym, which was also the auditorium, and we would listen to a speech by a strange grown-up from the big world outside. When I was quite young, the speaker was usually a policeman or a fireman. Later, in high school, he tended to be a narcotics specialist from the Federal Bureau of Investigation.

I always liked assemblies. They broke up the monotony of the school-day routine. So when I left school and got a job, I was delighted to discover that grown-ups have assemblies too, only we call them seminars. And instead of cops and narcs and Smokey the Bear, we get to learn about really exciting things — like software testing techniques. That was the subject of a six-hour seminar presented recently to my department.

It was a fair to middling seminar, conducted in the modern "overhead-driven" style. That means that the speakers use overhead projectors to display typed outlines of their talks. Since the print is so small and can be read only from the front row, they make photocopies of the outlines and hand them out to each member of the audience. This takes care of everybody who knows how to read. For the benefit of everyone else, they read the outlines aloud.

I would say that our speakers had almost mastered this new style of public speaking, although they evidently lacked confidence in its effectiveness. It surprised me that they felt it would take six hours to bore and befuddle us. A first-rate seminar speaker, in my experience, can generally accomplish the same result in 40 minutes — less with a good tail wind.

Although the speakers were good, the audience was better. They knew precisely what was expected of them, especially those in the second row from the back of the hall. As you may know, this is where you find the best talent at seminars. These old pros know that in seats closer up, the glare from the overhead projector burns through their closed eyelids.

The folks in the second row from the back were in especially good form at our seminar. If you looked down the row at about 2:05, you saw 10 people slumbering in a line, their heads settled back against the wooden railing behind them, their faces upturned with expressions of undistracted tranquility, quite like a beach full of early-summer sun worshippers.

Seminar 'Specialists'

A good seminar audience, like a good football team, has to have specialists. Particularly important are the Incomprehensible Questioner, who specializes in interrupting the speaker to ask long, meandering questions that have nothing to do with the subject; the Last-Minute Inquirer, whose job is to make every session run 20 minutes late by asking "just one last question" after another; the Terminator, who asks the traditional closing question: "Just what was the point of all this, anyway?"; and the Minstrel, who answers the Terminator with the graceful and intricate "Song and Dance."

The top prize for a freestyle performance by a member of the audience went, predictably, to one of the supervisors — I'll call him Bill. The seminar was in its final hour. Bill was sitting rigidly at attention in the center of the last row, setting a good example for the troops. Sally V. Whozit was explaining her new testing procedure for about the 12th time. Just behind me, a couple of women were speculating on what the 'V' in Sally's name stands for.

Suddenly, I heard an awful, choking cough from the back of the room. It was Bill. He was staring straight ahead, wide-eyed and red-faced. His body shook, and his lips were clenched in a ghastly grimace. He looked as if he had swallowed a pencil. I was trying to remember how to perform the Heimlich Maneuver when the fellow beside me said, incredulously, "He's laughing!" Sure enough, he was. Like a boy in church, ashamed of himself, yet unable to stop, he laughed on and on in stoic misery.

Finally, his laughter began to subside. Then someone asked Sally Whozit to explain her procedure for the 13th time, and Bill was off again. For the rest of the session, every time someone asked a silly question, Bill just fell apart; I never saw anyone laugh so much.

An hour later, when the session was over, I tracked him to the couch in the nurse's office and asked him where he had found the inspiration for such a performance. "The seminar was so stimulating," he gasped, "that I just couldn't contain my enthusiasm any longer."

Scott is based in Milwaukee, Wis.

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Insurer Ends Outage Problems With 'Dads'

By Paul Gillin
CW Staff

HARTFORD, Conn. — Until recently, the management information systems department at Connecticut General Life Insurance Co. was bedeviled by a frequent and frustrating problem. Every couple of days, when the computer system was brought up, it would suffer a job control language problem. The resulting system shutdown would idle 2,000 terminals across the country for 10 to 15 agonizing minutes.

"The greatest problem we had was that in just one copy of CICS there are 6,000 programs and 500 files spread over perhaps 15 applications," said Doug Price, manager of CICS development. "The system depended on the files being in good structural order when the system was brought up. But because of troubles during the night, we couldn't always rely on the data sets being available to CICS in the morning. So we were constantly having [job control language] errors as a result." Each time the system went down, the entire network was paralyzed, he said.

As one of the country's largest life insurance companies, Connecticut General uses a nationwide computer network connected to seven IBM 3033s and 3081s at its headquarters here. The support staff consists of manager Price, a staff of seven CICS systems programmers and five systems programmers in the Integrity Support Group. More than 20 copies of CICS are used to process 1.5 million user transactions daily. The company's dental system alone sees a third of those transactions, Price said.

(Continued on Page 42)

STSC Introduces APL*Plus/1280

ROCKVILLE, Md. — STSC, Inc. has announced the release of APL*Plus/1280, which reportedly is composed of the firm's proprietary enhancements and extensions to IBM's VS APL product implemented in IBM MVS/TSO environments.

The APL*Plus/1280 offering includes an on-line dump that permits 24-hour system availability; read/writing chaining; enhanced utilities and configuration control; and an improved file-print facility that is used directly rather than by means of shared variables, the vendor explained.

The software also is said to include STSC's Nested Arrays System, its Sharefile system, its Emma data management utilities, software development tools, programmer utility work spaces, an error-handling facility and formatting features.

APL*Plus/1280 requires an IBM 4341, 370/145 or larger, IBM 30 series or plug-compatible mainframe capable of running MVS. It was designed to be a fully compatible superset of IBM's VS APL program product and reportedly requires no changes to MVS or TSO.

The offering is available for a one-time license fee of $70,000, with an annual support and maintenance fee of $10,500. The perpetual license may be paid in 36 monthly installments of $3,500, including support and maintenance. APL*Plus/1280 may be licensed for a minimum of six months at $3,500/mo, including support and maintenance.

STSC is located at 2115 E. Jefferson St., Rockville, Md. 20852.

Fits IBM Machines

'Impacts,' 'Standard' Unveiled

DAYTON, Ohio — Convey Companies, Inc. has announced an on-line application generator called The Standard. At the same time, the company released Impacts, an on-line loan-closing system.

Both packages run on IBM 370, 30 series and 4300 series computers utilizing CICS with OS or DOS and Vsam files.

The Standard employs an event scheduler that drives a multipurpose program that resides in memory, a spokesman said. The program consists of a group of precoded assembly language functions that execute many business processes. A user-defined data dictionary and CRT screen create the event schedules that control the applications process and creation of the data base, the spokesman added.

Data base creation is via on-line data entry. Display and update security is provided at element, screen and record levels. A transaction journal reportedly logs each addition, deletion and change made.

As changes are made to the data dictionary, The Standard modifies each record to reflect the new requirements of the application. The license fee is $85,000.

Impacts is said to provide a data dictionary of more than 1,500 elements to capture and validate data, perform calculations, track applications, control security, print and move closed applications to the mortgage processing system.

The system includes a comprehensive data dictionary with unlimited expansion, unlimited CRT screen capability, more than 200 predefined calculations, tracking of 99 unique application types through 16 unique processing steps and a tickler subsystem to flag key elements, the spokesman said.

Impacts also incorporates a mini word processor, produces 33 reports and has plot-printing capability, according to the spokesman. A one-time license fee is $35,000 from 3400 S. Dixie, Dayton, Ohio 45439.

'Masterflex Menu' Targets IBM CICS

WAYNE, Pa. — American Data Management Systems, Inc. has released Masterflex Menu, a standardized on-line menu system designed to run in any IBM CICS environment.

Masterflex Menu reportedly provides a two-level, password-protected menu system for application use. Passwords can be required at the system level and at the application level, thereby preventing unauthorized personnel from viewing privileged information.

In addition, this product eliminates the need to write new programs or maintain already existing menu programs and maps, according to the vendor. It provides all end users with a single entry point into the CICS applications, thereby eliminating the need to remember various entry transaction codes.

Masterflex Menu costs $2,100, the vendor said from 154 Homestead Road, Wayne, Pa. 19087.

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Business Package Updated For DG Minis

DUNSMUIR, Calif. — Applied Business Systems (ABS) has announced Revision 1.2 of its Order Entry-ABS interactive business package for Data General Corp. Nova and Eclipse computers under RDOS or AOS. The system includes four major modules: order entry, billing, inventory control and sales reporting.

The package accepts orders, generates a sales order while reserving inventory, then relieves inventory upon creation of an invoice and interacts with the open order master files to report on the status of new and open orders, a spokesman said.

Full or partial shipments are allowed with back-order reporting. The system also allows display, modification, rescheduling, cancellation or release of outstanding orders. When orders are received, customer information from the customer master files is displayed for credit and term checking. As the order is entered, product information from the item master file is displayed.

Order Entry-ABS can be used as a stand-alone system or in conjunction with other ABS software, including Purchase-Master and Production-Master, the spokesman said. Price is $3,000 for a single CPU or $4,500 for multiple CPUs from 4350 Upper Soda Road, Dunsmuir, Calif. 96025.

'VSEE' Targets IBM DOS/VSE

KANSAS CITY, Mo. — Little Blue Systems, Inc. (LBS) has introduced an on-line transaction monitor for IBM and plug-compatible DOS/VSE systems called VSEE.

VSEE, which represents LBS's entry into the performance monitor and system utility market for IBM 370 systems, is said to provide four screens of partition information. Two screens display activity status for one background and 10 foreground partitions. Categories include current partition priority, task information block flag, user program sense indicator, job name and description from DOS job card, current phase execution, CPU and start time of current phase being executed, devices being used by that job and the number of start I/Os for each device. The screens also list up to 10 tape devices and their partition assignments, the spokesman said.

A third screen lists and describes up to 92 I/O devices in the system, tells where they are assigned and shows what volume is currently in use on tape and disk drive. A fourth screen provides a snapshot of the current system console display, the spokesman said.

VSEE leases for $600/year from LBS through P.O. Box 19867, Kansas City, Mo. 64141.

Honeywell DM-IV Users Get Data Dictionary Package

MECHANICSBURG, Pa. — CACI-Federal, Inc. has announced CACI/DDS-4, a data dictionary, directory and documentation package for users of Honeywell, Inc.'s Data Management IV (DM-IV) and Transaction Processing software.

CACI/DDS-4 currently supports Honeywell Level 66 and DPS 8 processors running under Honeywell's Gcos operating system and using Cobol 74.

The package acts as a central repository for documentation for all application programs and a comprehensive map of all data entities and their relationships. The data dictionary contains, among other things, information about data elements, programs and applications systems affecting data and user organizations that might be responsible for maintaining data, the vendor said.

CACI/DSS-4 operates in a Honeywell DM-IV Integrated Data Store-2/TP environment using both batch and on-line processing to update the data dictionary. The package can provide both hard-copy reports and on-line inquiries for the DP staff, data administrators and DP auditors.

Schema, Subschema and Cobol program source files are used as input to generate information in CACI/DDS-4, the vendor said.

CACI/DDS-4 costs $23,000 including one year of maintenance. Leasing terms are also available, the vendor said from 5010 Trindle Road, Mechanicsburg, Pa. 17055.

Cash Management System Debuts

SHEBOYGAN, Wis. — Heritage Computer Corp. (HCC) has introduced a Cash Application Management System (Cams) for IBM mainframes running CICS.

Cams is designed to handle and control cash receipts and insurance applications and to facilitate distribution of cash payments to the proper ledger accounts.

The software is designed for use by companies having the HCC All Lines Premium System and the HCC Claims System. Geared toward same-day bank deposit of funds, Cams is an on-line system utilizing IBM's CICS software. Cams is written in Ansi Cobol.

Cams carries a one-time license fee of $15,000 from the firm at 2300 Kohler Memorial Drive, Sheboygan, Wis. 53081.

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TITLE OCCUPATION/FUNCTION

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12 VP/Assistant VP
13 Treasurer/Controller/Finance Officer
21 Director/Manager of Operation/Planning/Administrative Service
22 Director/Manager/Supervisor DP/MIS Srvs
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mtg Sales Representative
52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
80 Librarian/Educator/Student
90 Other _____

'MS/CS' Introduced For Four Phase MFE

ARLINGTON, Texas — Legist Automation, Inc. has introduced a software system that reportedly provides control, accounting, security and audit functions for any Four Phase System, Inc. processor that supports Four Phase's MFE operating system.

The MS/CS software reportedly allows a supervisor identified by a password to view actual images of all screens on the system and to take control of the screen from the operator. This enables the supervisor to shut down the system, even if other terminals have been left connected.

MS/CS logs all system activity, enabling easy accounting and auditing. Its built-in security features include console and password control of access for each application, according to the vendor.

This product costs $3000, the vendor said from 1212 Millbrook Drive, Arlington, Texas 76012.

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	CIT-427 Color Graphic CRT	3 695	357	185	112
EVIDEO	610 CRT Terminal	650	62	30	24
	925 CRT Terminal	850	82	45	31
	950 CRT Terminal	1 075	103	57	38
NEC SPINWRITER	Letter Quality 7715 RO	2 695	259	144	88
	Letter Quality 7725 KSR	3 195	307	171	115
GENERAL ELECTRIC	3830 KSR Printer 30 CPS	1 195	115	67	42
	2138 KSR Printer 120 CPS	2 195	211	117	80
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Data 21 Enhances RPF Package

TORRANCE, Calif. — Data 21 has announced enhancements to its Remote Print Facility (RPF) package, which provides an interface to IBM VSE/Power Queues to enable users to print, display and submit jobs on 3270-type terminals under CICS.

The enhanced version includes Forms Control Buffer (FCB) support to allow CICS printers to simulate channel commands for forms control, a spokesman said. Table entries to define form name and associated FCB name allow RPF to check for an FCB prior to starting a print task. If an FCB is required, RPF loads it and translates all channel requests accordingly.

With RPF, the spokesman continued, any power report can be printed on any CICS printer as well as on system printers with RPF. If a report is printed with a carriage control tape, it is necessary to create an FCB for on-line printing.

The license fee is $2,100, according to the spokesman from Data 21 at 19110 Van Ness Ave., Torrance, Calif. 90501

'Reformer' Aids Cobol

WAYZATA, Minn. — Commercial Programming Services, Inc. has introduced a productivity aid for Cobol programs on IBM 4300 series and larger mainframes, as well as plug-compatibles.

Reformer is said to increase programmer productivity by allowing programmers to use the Cobol shorthand feature and by cleaning up old, hard-to-read Cobol programs.

All Data Division and Procedure Division statements are realigned to make the program easier to read and all IF statements are realigned to avoid the confusion of nested statements, according to the vendor.

Reformer costs $1,500 from the firm at 3701 Shoreline Drive, Wayzata, Minn. 55391.

Design Aid Out for IMS

ANN ARBOR, Mich. — Database Design, Inc. has added a hierarchical design aid module to its Data Designer package for users of IBM's IMS data base management system.

Data Designer assists data analysts in developing logical data models that support stable data structures, a spokeswoman said.

The hierarchical design aid looks for natural hierarchies in a logical data model to produce a structural model for IMS. The aid points out issues that must be resolved before implementation.

The current price for Data Designer is $30,900, with the hierarchical design aid priced separately at $3,000. The price for Data Designer will increase to $35,000 on March 1, the spokeswoman said.

Database Design is located at 2020 Hogback Road, Ann Arbor, Mich. 48104.

Finance Tool Gets Upgrade

SKOKIE, Ill. — Data Directions, Inc. has enhanced its client accounting package for the Data General Corp. Cobol compiler. The package reportedly gives the ability to stack unlimited report requests. It costs $6,000 from Suite 12, 5225 Old Orchard Road, Skokie, Ill. 60077.

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Noesis Announces Packages for HP 3000 Users

SAN FRANCISCO — Noesis Computing Co. has announced a line of interactive software that reportedly serves trade associations, membership organizations, meeting planners and publishers.

The software is said to run on the Hewlett-Packard Co. HP 3000.

The three packages — Peopletrak, Meetingtrak and Ordertrak — reportedly store information in a common data base so that the user need only enter or update information once.

Each system is integrated with Noesis' financial accounting software and employs Quasar Systems Ltd.'s Quiz for user-generated inquiries and reports, according to a Noesis spokesman.

Peopletrak reportedly provides on-line management of membership and subscriber information.

Meetingtrak handles small seminars to large conventions, the vendor said.

Preregistration, hotel and session reservations as well as refunds are all reportedly handled on-line.

Ordertrak is said to provide on-line order processing for periodicals, books, reprints and other subscription fulfillment material and includes on-line customer history, pick lists and inventory control.

All packages include invoicing and cash receipts and are available on a time-sharing basis, according to the vendor.

Peopletrak costs $7,000, while Meetingtrak and Ordertrak cost $10,000 each.

Noesis is located at 615 Third St., San Francisco, Calif. 94107.

Insurer Solves Outage Woes With 'Dads'

(Continued from Page 39)

Since he knew of no commercial packages that would solve his problem, Price consulted Software Technologies and Research, Inc. of Rocky Hill, Conn., to develop a dynamic allocation system that would reduce the system's reliance upon complete data set files.

Connecticut General needed a facility for dynamic allocation of data sets so the system could bypass a missing file rather than shutting down. Software Technologies and Research coded a specialized package in about eight months, then completely rewrote the package for commercial use. The package they developed, called Dynamic Allocation/Deallocation Subsystem (Dads), has solved the company's allocation problems. Connecticut General was the beta test site for Dads, which was announced in October [CW, Oct. 18], and has used the commercial package for about six months.

"The key benefit to us has been in the area of [job control language] outages," Price said. "They used to drive us crazy, but since we've installed the package we've suffered no more outages caused by [job control language] problems. We don't even load the [job control language] for user files any more."

Dads has allowed data dictionary statements to be removed from the job control language, preventing an error should a user data set be missing. The file can be allocated when it becomes available, Price said.

The system also incorporates improved diagnostics, and "If there's a problem with allocation, it saves return codes in the Vsam files so we can reference allocation errors or successes," Price said. "That gives us a good picture of what went wrong and allows us to correct and reallocate it quickly."

A dynamic verification feature has enabled systems programmers to bypass the time-consuming process of verifying all files before starting CICS. Dads supposes no verification will be needed, Price said, and opens the files automatically, verifying only where necessary.

More time is saved with a class function that allocates and deallocates whole groups of files with a single command. Now, Price said, a programmer can initiate the function for 15 files by typing in a single command, saving 29 manual steps and reducing the margin for error.

The bottom line on benefits is reliability, Price said. Job control language outages take their toll in time and irritation. With Dads, Price said, "We've eliminated the administrative headaches caused by the whole problem."

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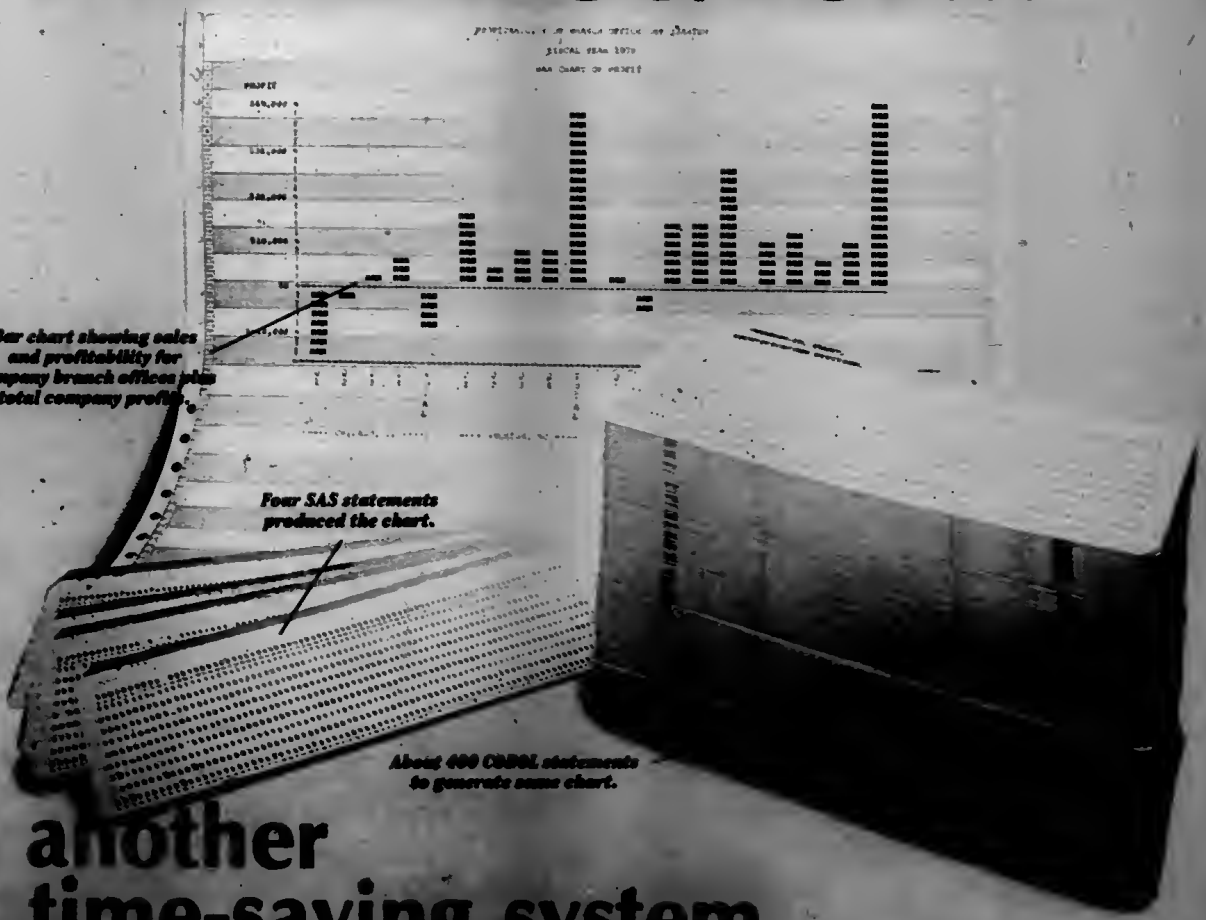

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Quasar's 'Powerhouse' Announced for HP 3000

OTTAWA — Quasar Systems Ltd. has introduced an application development software package for the Hewlett-Packard Co. HP 3000.

Powerhouse comprises four products: Quick, an on-line system generator; Quiz, a report writer; Quasar Transaction Processor, a batch transaction processor; and. Dictionary Plus. They can be purchased individually or as a complete package.

For the entire package, the first copy costs $19,500 (U.S.), and each additional copy costs $9,750. On a one-year lease, the first copy costs $1,170/mo and each additional copy costs $585/mo, a spokeswoman said from 275 Slater St., 10th Floor, Ottawa, Ont., Canada K1P 5H9.

'Bid-Asyst' Tracks Bids

MILWAUKEE — System 5 has introduced an information service that reportedly analyzes bidding histories and market trends for contractors.

Bid-Asyst is said to track bids of competing contractors in order to find weaknesses in their bidding strategies. The package helps users predict how their competition will bid on future jobs, a spokesman said. It also shows contractors how changes in bidding strategies will affect profits and which markets allow more profitable markups.

Bid-Asyst is available on a time-sharing basis with prices starting at $100/mo from System 5 at 615 E. Michigan St., Milwaukee, Wis. 53202.

Finance Aid Targets DG

ARMONK, N.Y. — Exact Systems and Programming Corp. (ESP) has announced the release of an on-line, interactive, transaction-oriented accounting system for Data General Corp. microcomputers and minicomputers.

Accountbase is composed of independent accounting application modules, such as accounts payable, accounts receivable and general ledger.

The modules may be operated as stand-alone applications, or the fully integrated Accountbase systems may be implemented.

Each application module includes CRT screen programs, file-creation facilities and report generation programs, the vendor said. The system may be implemented as-is or modification can be made by ESP or the end user.

One-time costs for use on a specific Data General computer are as low as $3,750, including installation, training and documentation, according to the vendor.

The vendor is located at One Labriola Court, Armonk, N.Y. 10504.

HP 3000 Gets Payroll/Personnel Package

AUSTIN, Texas — Tymlabs Corp. has released a payroll/personnel package for the Hewlett-Packard Co. HP 3000 computer.

The menu-driven system features on-line data entry and updating with instant validation, a company spokesman said. Calculations for the package are based on a predefined file of rates, formulas and parameters.

The package requires no modification to existing programs, according to the spokesman.

Up to 99 companies, each with 99 divisions of up to 99,999 departments may be kept in a single file, the spokesman said.

The package is based on payroll components including hours/earnings, other compensation, voluntary deductions, tax deductions and vacation/sick leave, the spokesman said.

An accounting distribution parameter file allows the user to specify how payroll components are distributed to the general ledger, according to the spokesman.

A general ledger transaction file is created each time payroll checks are produced, reflecting distribution of paycheck components, net check amounts and company cost accruals, the spokesman said.

The package costs $5850 including a menu processor.

Tymlabs is located at 211 E. 7th St., Austin, Texas 78701.

Fortran 77 Source Program Released for Apples

MEMPHIS, Tenn. — Softronics, Inc. has released a Fortran 77 source program that reportedly provides Softrans protocol compatibility for file transfers between Apple Computer, Inc. personal computers and any host computer.

Softrans is used in conjunction with Softerm, the company's high-speed CRT terminal emulation program for Apple computers, to exchange data between the Apple II and any host that provides Fortran 77 language capability.

Softrans protocol, which operates in a block mode using asynchronous communications, reportedly provides error detection with automatic retransmission, automatic binary encoding and decoding, CRC-16 check sum and data compression to enhance line utilization.

The Fortran 77 program is executed on the host system under the control of the Apple II, which when running appears to the host as a standard CRT terminal.

Commands may be entered that allow file directories to be displayed and files to be transferred to and from the Apple and host computer.

The Softerm terminal emulation program includes a 300-page user's guide; terminal emulation for the IBM 3101, Digital Equipment Corp. VT102 and VT52, Televideo Corp. 910 and similar computers; the Softrans protocol; and Fortran 77 source program.

The program is available for $150 from Softronics, 6626 Prince Edward Place, Memphis, Tenn. 38139.

Ada Exchange Announced

MADISON, Wis. — RR Software will be sponsoring an Ada software exchange that is reportedly geared to provide low-cost or public domain software to exchange members.

The programs and libraries being distributed by the firm are written in the company's Janus/Ada, an Ada subset reportedly designed and developed for the microcomputer systems environment.

A feature of the Ada language is said to be the ability to create libraries of routines that can be used in more than one program.

It is hoped that this feature in conjunction with software exchanges will help promote Ada as a tool to increase programmer productivity, the spokesman said.

Janus/Ada also reportedly offers separate compilation and user-defined types.

Package prices start at $300, the vendor said.

RR Software can be reached through P.O. Box 1512, Madison, Wis. 53701.

Property Firms Get Finance Tool

ENGLEWOOD, Colo. — A financial management system for property management using the IBM System/23 Datamaster has been unveiled by NSI Corp.

The Property Management Financial Management package comprises general ledger, accounts payable, income and deposits and payroll functions. The system was designed to provide accounting control.

The software costs $5,000 from Suite 104, 3375 S. Bannock, Englewood, Colo. 80110.

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Runs on DEC VAX

DBL/VMS Version Out

SACRAMENTO, Calif. — Digital Information Systems Corp. has announced that a Digital Equipment Corp. VMS native-mode version of its Data Business Language (DBL) is now available.

With the addition of DBL/VMS, the Dibol-11 source-code-compatible language is now available for DEC RT-11, TSX/TSX-Plus, RSTS, RSX-11M/M-Plus and VAX/VMS compatibility mode. The DBL/VMS compiler is written in VAX/VMS native mode and is said to be a true compiler.

The output of the compiler is in-line native code and entire applications reportedly can be bound into a single module. The price of DBL/VMS is $5,300 from the firm at Suite 340, 3336 Bradshaw Road, Sacramento, Calif. 95827.

CDC Introduces Management System

GREENWICH, Conn. — A liability management system is available from Control Data Corp.'s Business Information Services (BIS).

The Exam system consists of portfolio, balance sheet and analysis and presentation components.

There is a $200/mo minimum usage fee for BIS subscribers, which gives them access to the entire BIS library, CDC said from 500 W. Putnam Ave., Greenwich, Conn. 06830.

HP Discounts Two Series 80 Aids

CORVALLIS, Ore. — Hewlett-Packard Co. has announced discounts on two software packages for its Series 80 computers.

The Personal Productivity Pac includes Visicorp's Visicalc Plus, Word/80 and File/80 packages for a combined cost of $250. The programs enable the user to write memos, letters and reports; create files, and analyze information, a spokeswoman said.

The second offering includes Peachtree Software, Inc.'s Series 8 general ledger, accounts payable and accounts receivable software in a package priced at $1,500. The integrated packages reportedly allow entries to accounts payable and receivable to be posted automatically in general ledger.

Both packages are available in 3½-in. and 5¼-in. floppy disk formats. The offer is good through February 28 from HP at 1000 N.E. Circle Blvd., Corvallis, Ore. 97330.

System/38 Gets 'Recompile'

MEMPHIS, Tenn. — Computer Technologies International Corp. has announced a file management package for the IBM System/38.

Called Recompile, the package reportedly allows users to recreate existing programs due to an alteration of a program or file. Programs may be selected by generic name, library, program type and a file they use. All existing file attributes are retained.

Programs that fail to compile are not deleted, the spokesman added. An optional audit listing can be generated to summarize compilation information and results.

Recompile costs $850 from the vendor through P.O. Box 18621, Memphis, Tenn. 38118.

Inter-Pro Runs Under VRX

CINCINNATI — Bonnecaze, McLeroy & Harrison, Inc. of Dallas is marketing its Inter-Pro interactive language through Software Clearing House here.

Operating under NCR Corp.'s VRX operating system, Inter-Pro is said to allow a programmer to code and test programs from his terminal without link editing or compiling.

Inter-Pro is available at an introductory price of $3,200 from Software Clearing House, 771 Neeb Road, Cincinnati, Ohio 45238.

'Model' Version Runs on Primes

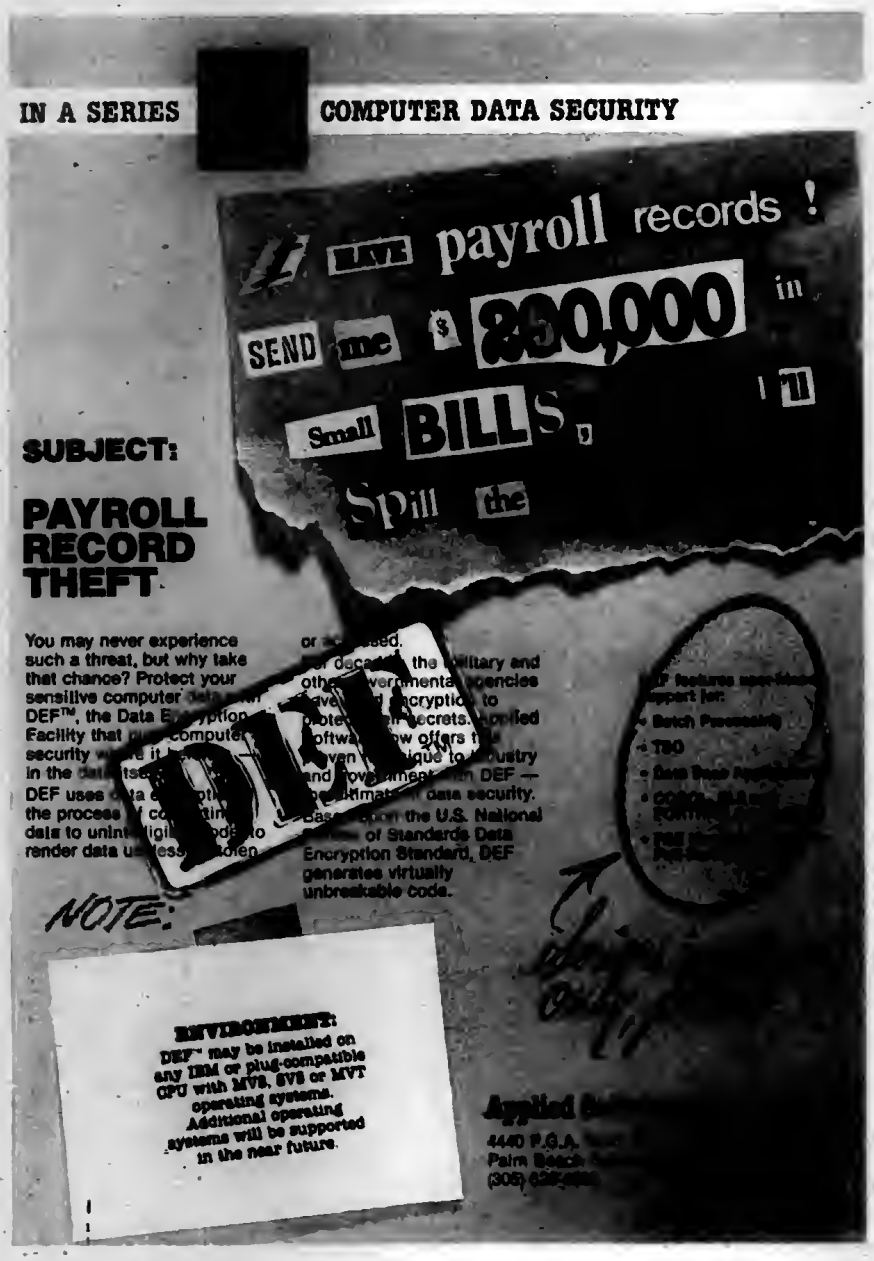
NATICK, Mass. — Prime Computer, Inc. has announced that a version of Lloyd Bush and Associates' Model interactive financial modeling and decision support system is available for Prime computers.

The Prime version of Model is composed of 28 separately priced modules designed to address business applications including budgeting, manpower planning, corporate modeling, merger/acquisition studies and project scheduling, a Prime spokeswoman said.

The entry-level package, priced at $9,000, includes basic budgeting and planning and the production of pro forma statements. The package includes a What If subsystems read/write feature.

A report writer produces standard templates and customized reports; a trace feature performs on-line editing; and a Help facility explains commands and arror messages.

Lloyd Bush and Associates is located at 156 Williams St., New York, N.Y. 10038.



Prompter Out For CA-Earl

JERICHO, N.Y. — Computer Associates International, Inc. has added an on-line prompting facility to CA-Earl, its on-line retrieval and reporting system for IBM and plug-compatible mainframes operating under DOS/VS (E).

Based on user commands, the prompter automatically formats and generates a program to produce the required reports. Release 4.0 of CA-Earl also provides expanded Vsam support, extended features in the execution of user-supplied prewritten programs and routines from within a CA-Earl program, automatic formatting for up to 254 reports with a single sort and the ability to define a numeric field as unsigned packed decimal and to print any field in hexadecimal format.

A three-year lease costs $8,800, the vendor said from 125 Jericho Tnpk., Jericho, N.Y. 11753.

Utility Enhanced For IBM CPUs

GRANADA HILLS, Calif. — Dylakor has announced Release 7.5 of DYL-260, a fixed-form report writer and utility for users of IBM 360, 370, 30 series, 4300 series and plug-compatible mainframes under OS, DOS, SSX or CMS.

The release reportedly offers an increase in the allowable number of program statements and reduces the time required to compile, while expanding the size of the compiler work area, a spokeswoman said.

Standard features include multiple reports, automatic cycle, copy feature, internal sort, data selection and handling, arithmetic and formula calculation, bit-level manipulation, handling of any data type and tabling.

The yearly cost for a three-year lease is $1,680, the spokeswoman said from 17418 Chatsworth St., P.O. Box 3010, Granada Hills, Calif. 91344.

Package Gets RSTS/E Version

MONTROSE, Calif. — Mini-Computer Business Applications, Inc. has announced that its Distribution System, a set of integrated on-line accounting packages, can now be used on Digital Equipment Corp. RSTS/E systems.

Originally designed for use with DEC systems running under the RT-11 operating system, the Distribution System package includes customer order processing, accounts receivable, fixed assets and depreciation, purchase order and receiving, general ledger, inventory management, accounts payable and payroll modules, the vendor said.

The vendor's Material Processor and Job Costing packages, which also interface with the Distribution System, are available on RSTS.

The RSTS versions of the software cost between $2,500 and $4,000 for a single processor, the vendor said from 2441 Honolulu Ave., Montrose, Calif. 91020.

'Convert' Out for DEC Ascii, IBM Ebcdic

EDISON, N.J. — Edison Software Systems has announced a package for the exchange of tapes between the Digital Equipment Corp. Ascii and IBM Ebcdic environments.

Called Convert, the nonprivileged package can be called from a program or invoked from a terminal to process a tape with a single command line, a spokesman said. It can process tapes with standard IBM labels or nonlabels.

Capabilities include performing volume serial verification for IBM standard labeled tapes, handling all blocking and unblocking internally, optionally dropping trailing blanks on each record during read operation and converting DECtabs to multiple spaces on output, allowing use of high-speed IBM printers.

Users can choose tape density for input and output in all IBM and DEC densities, the vendor spokesman said.

The purchase price for Convert is $8,500 from Edison Software at 190 Lincoln Highway, Edison, N.J. 08820.

VAX RPG Compiler Unveiled

RICHMOND, Va. — Data Management Systems, Inc. has introduced a native-mode Digital Equipment Corp. VAX RPG compiler.

Compatible with DEC PDP-11 and IBM batch programs, the compiler reportedly gives DEC users the ability to run their PDP-11 RPG programs on VAX in the native mode. It also provides an upgrade to the 32-bit architecture of VAX.

Because the compiler is compatible with IBM System/32, 34 and 3, the compiler provides an upgrade option for IBM users and enables them to upgrade to a DEC system without sacrificing their investment in IBM batch programs, the vendor claimed.

The end-user single-use license fee is $9,500. The license fee includes a one-year warranty that entitles the user to full support and updates to new versions. The price of a full-support contract after the warranty expires is $950/year. The vendor is located at Suite 202, 2922 Hathaway Road, Richmond, Va. 23225.

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Wang VS Family Gets Cobol Package Update

MONTROSE, Calif. — Mini-Computer Business Applications, Inc. (MCBA) has announced Release 3 of its accounts receivable Cobol package for the Wang Laboratories, Inc. VS family of computers.

The package is an interactive, open item and balance forward package with multiuser and multicompany capability, a spokeswoman said.

Wang accounts receivable automatically posts sales tax to up to three user-defined general ledger account numbers, the spokeswoman said. The new release features expanded fields for general ledger account number, customer credit limit, account balance, discount percentage, sales commission amount and maximum invoice amount.

Credit history data is maintained for each customer. Customers can be flagged as to credit status, according to the spokeswoman.

A new 30-character comment can be entered for each customer to print on reports and display in customer account inquiry, the spokeswoman added.

A source code license for an MCBA Wang account package is $3,000 for a single CPU from MCBA, which is located at 2441 Honolulu Ave., Montrose, Calif. 91020.

Controls Outside Operations

'Epics' Targets 'Mapics' Users

NEEDHAM, Mass. — Marcam Data Systems Corp has unveiled a software system that reportedly allows IBM Manufacturing, Accounting and Production Information Control System (Mapics) users to control manufacturing operations performed by the vendor.

The External Production Information Control System (Epics) works with Mapics to provide detailed control over outside operations. The system permits the entry of a purchase order for each manufacturing operation and creates new inventory transactions to issue material to a purchase order, move it to the vendor and transfer material directly from vendor to vendor, a spokesman said.

Epics runs on the IBM System/34 and System/38 and interfaces with any or all of the following Mapics modules — Product Data Management, Inventory Management and Production Control and Costing, the vendor said.

Epics carries a one-time license fee of $3,900. More information is available from the vendor at 123 Highland Ave., Needham, Mass. 02194.

'Fiscal' Enhancement Out

FAIRFIELD, N.J. — The Rapidata Division of National Data Corp. has announced the release of the Financial Data Management System (FDMS), an enhancement to its Fiscal financial planning and reporting language.

FDMS is accessible through any user-developed program utilizing Fortran or Fiscal and will reportedly enable users to create larger financial data bases. It allows a data base containing up to 2,000 reporting-level organizations, 2,000 consolidation-level organizations and 1,000 defined consolidation paths.

FDMS is available on Rapidata's Rapidten remote computing service, which can be reached via standard data terminals or microcomputers, the vendor said.

Costs vary according to connect time and volume, the vendor said from 20 New Dutch Lane, P.O. Box 1049, Fairfield, N.J. 07006.

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Screen Handler Introduced For HP 3000 Processor Users

MONTREAL — Probe Software Sciences, Ltd. has announced GEN/5 Screen, a character-mode screen handler for the Hewlett-Packard Co. HP 3000 processor.

GEN/5 Screen reportedly allows the user to develop a format from a blank input screen. The package can define the screens in several parts and display each window as required, a spokesman said, allowing multiple formats on one screen. Add, store, copy, delete and modify functions are provided. The screen handler also generates the code necessary to access the screens into the working storage and procedure divisions of the programs, the spokesman said.

GEN/5 Screen is not restricted to any terminal type. The package costs $5,000 from Probe at Suite 2101, 666 Ouest Rue Sherbrooke, Montreal, Que., Canada H3A 1E7.

Scribe Available on Apollo Domain

CHELMSFORD, Mass. — Apollo Computer, Inc. has announced the avsilability of Unilogic, Ltd.'s Scribe text processing and document production system on the company's Domain Processing Systems.

Scribe is designed for producing reports, manuals, proposals, specifications and book-length manuscripts, a spokesman said. Features include merging text with graphics, producing color slides and automatically creating indexes, bibliographies and tables of contents, the spokesman continued.

Scribe links the Apollo Domain to a range of printers. The Apollo Domain can optionally drive more than 50 kinds of printing devices, the spokesman said. Scribe costs $5,000 for the first node and $1,000 for each additional node from Apollo at 15 Elizabeth Drive, Chelmsford, Mass. 01824.

For PDP-11s, VAX-11s

Info Retrieval System Out

LEXINGTON, Mass. — A data base and information retrieval system for Digital Equipment Corp.'s PDP-11, VAX-11 and LSI-11 computers running RT-11 (Basic), RSX-11 and VMS has been announced by Indecs Services.

Called Isdata, the system reportedly is comprised of data search, sort and report generation functions that include summations and averages of numeric information. Reports can be printed using formats designed by the users, the company claimed. A documentation generator allows the user to document any data base on the system, according to a spokesman for the vendor.

The package costs $750 for RXO2 media and $1,000 for RLO2 media, the vendor spokesman said from 93 Outlook Drive, Lexington, Mass. 02173.

Documents Tool Out for IBM 4300

DALLAS — Image Sciences, Inc. has announced application software for the electronic printing of business documents and forms.

Designed for IBM 4300 and larger mainframes, the Electronic Forms Library is an order fulfillment and distribution system for forms and documents generated from computer memory, according to a vendor spokesman.

The base price for the system is $120,000, a spokesman said from Suite 700, Campbell Centre One, 8350 N. Central Expwy.; Dallas, Texas 75206.

Imlac Series II Gets Packages

NEEDHAM, Mass. — Imlac Corp. and General Electric Computer-Aided Engineering (CAE) International, Inc. have announced that four major engineering design and analysis software packages developed by Structural Dynamics Research Corp. (SDRC) support the Imlac Series II interactive graphics terminal.

The Imlac Series II terminal is an Intel Corp. 8086 microprocessor-based refresh stroke vector terminal with up to 192K bytes of random access memory for graphics storage. The four software packages it can now implement are SDRC's System Design, Geomod, Supertab and Systan.

Prices for the software start at $40,000. General Electric CAE International, Inc. is located at 300 Technecenter Drive, Milford, Ohio 45150.

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Micro Notes

A **data base manager** for North Star Computer, Inc. Northstar SOL-20/S-100 systems is available for $149.95 from Minnetonka Software, Inc. The software reportedly allows the user to create key files from the master file, selectively load them and perform data comparisons and sorts. The vendor's address is P.O. Box 392, Paramus, N.J. 07652

Personal Computer Products, Inc has released software said to allow the transfer of files from the Radio Shack TRS-80 Models I and III to the IBM Personal Computer. Communication programs and adapters are included. The package costs $39.95 from the vendor at Suite C-18, 1400 Coleman Ave., Santa Clara, Calif. 95050

Individual Software, Inc. has introduced **The Instructor**, a self-teaching tutorial designed to educate first-time IBM Personal Computer users. The software focuses on the interactive aspect of the Personal Computer Running on the Personal Computer with one diskette drive, 64K bytes of user memory and display, it costs $39.95 from the firm at 24 Spinnaker Place, Redwood City, Calif. 94065.

A farm and ranch accounting package for the Apple Computer, Inc. Apple II computer has been introduced by Harris Technical Systems, Inc. The **Agdisk Farm Accounting Package** is said to offer single-entry accounting with double-entry accuracy either on a cash or accrual basis. The software costs $600, with a $29.95 manual available from 624 Peach St., P.O. Box 80837, Lincoln, Neb. 68501.

Infostar, a data base management system that reportedly was designed for nonprogrammers, was announced by Micropro International Corp. for use on any microcomputers running under Digital Research, Inc.'s CP/M operating system. Infostar is menu-driven and, for data entry, includes a cursor that enables the user to draw forms on the screen, the vendor explained. In addition, the software is designed to enable users to generate preformatted quick reports by selecting the data desired. Infostar also includes full report-writing capabilities.

Available immediately, the complete Infostar software system includes a user training guide with example data files and other reference documentation for $495 suggested retail pricing, the vendor said from 33 San Pablo Ave., San Rafael, Calif 94903

An enhanced version of its **DB Master** data base file management software has been announced by Stoneware, Inc. for the IBM Personal Computer. The enhanced package was unveiled at the Comdex/Fall '82 show and, at the same time, the vendor announced that its Video Tape Training Library for Apple Computer, Inc.'s Apple II has been expanded to include the IBM Personal Computer.

The updated version of DB Master has a 3,000-char./record, whereas the Apple version permitted 1,200 char./record. The new version also makes a browse mode available so users can select specified fields for screen display from a series of data base records, the vendor noted.

DB Master for the IBM Personal Computer will be available on floppy disk during the first quarter of 1983. It is priced at $499 and requires an IBM Personal Computer with at least 192K bytes of random-access memory and two 320K-byte double-sided disk drives. A printer is recommended, the vendor said from 50 Belvedere St., San Rafael, Calif 94901.

Systemathica Consulting Group Ltd. has announced a series of **operating system extensions (OSX)** for the Hewlett-Packard Series 80 personal computers utilizing the plug-in HP82900 CP/M module containing an additional 64K bytes of random-access memory (RAM) and a Zilog, Inc. Z-80 microprocessor. The extensions are modular software products, which the company said are fully compatible with the original HP CP/M system software (from Digital Research, Inc.) and require no modification to applications programs.

OSX-1 is an implementation of CP/M. OSX-2 contains an extended operating system which recognizes a fictitious drive that is actually a large RAM bank; and OSX-3 is a modified implementation of CP/M that provides access to more than 64K bytes of RAM, the company claimed. OSX-4 allows CP/M to issue tasks to the Series 80 CPU that are processed in parallel, while execution continues on the Z80 CPU which is dedicated to CP/M. OSX-5 parallel processing system software configures the Z80 CPU and its 64K-byte RAM as an intelligent disk I/O co-processor. OSX-7 is an overlay management package for use in conjunction with OSX-2.

The company also announced three **system monitors**. Sysm-1 reportedly provides access to every byte of the system memory or of the disk subsystem. Sysm-2, which requires Sysm-1, is a native binary code disassembler. Sysm-3, which requires both Sysm-1 and Sysm-2, is a dynamic debugging tool.

Each module costs $100 from Systemathica at 4732 Wallingford St., Pittsburgh, Pa. 15213.

Softech Microsystems, Inc. has announced **Ksam**, a keyed sequential access method for microcomputer systems; **Edvance**, an advanced system editor, and **Priot Spooler**, which allows text files to be printed while the main processing task continues. All packages run microcomputers based on the University of California at San Diego's UCSD p-system operating software.

Ksam and Edvance each cost $200 and the Print Spooler costs $50 from 16885 W. Bernardo Drive, San Diego, Calif. 92127.

A menu-driven utility for the IBM Personal Computer user has been announced by Richard Waikel of Fort Wayne, Ind. **Help** is said to prompt the user for DOS commands and parameters, edit responses and pass them to DOS for immediate execution. Help requires a Personal Computer with one diskette drive, 64K bytes of memory, any monitor and IBM DOS. Help costs $19.95 from Waikel at 743 Walnut St., Fort Wayne, Ind. 46804.

A relational data base management system for the IBM Personal Computer is available from GMS Systems, Inc. **Powerbase** features Datazoom, which reportedly allows users to "explode information up to 16 levels deep." The user must have a Personal Computer with at least 128K bytes of random-access memory, PC DOS, two disk drives storing at least 160K bytes each (or the hard disk equivalent), a cursor-addressable terminal and a printer capable of an 80-col. width. Powerbase costs $475 from 12 W. 37th St., New York, N.Y. 10018.

R2E of America, Inc. has announced its marketing rights to Mark Williams Co.'s **Coherent microcomputer operating system**, with R2E's Micral 90 16-bit microcomputer series. This Unix-like operating system reportedly supports program development, application problem solving, transaction management and real-time systems. It costs $1000, an R2E spokesman said from 2545 W. County Road C, St. Paul, Minn. 55113.

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Local Data Cuts Converter Price

TORRANCE, Calif. — A 25% drop in the price of Datalynx/3270 protocol converters has been announced by Local Data Co.

The Datalynx/3270 is an interactive IBM 3276-2 Binary Synchronous Communications emulator that supports two asynchronous Ascii CRT terminals or a CRT terminal and a printer. The protocol convertor allows dumb terminals to emulate the IBM 3278-2.

Originally $1,950, the converter is now available for $1,450 from Suite 706, 2701 Toledo St., Torrence, Calif. 90503.

DPers Will Take Control Of Info Nets: Satellite Exec

By Bob Johnson
CW New York Bureau

NEW YORK — DP managers will win the battle for control over corporate data and information communications, according to a satellite company executive here.

Herman I. Kotler, chief operating officer of United States Satellite Systems, Inc. (USSSI), said in a recent interview that because American companies now place such value on the management and communication of information, high-level infighting for communications control is currently taking place between traditional "telephony-type" people and DPers.

The communications executive, formerly a marketing manager for Honeywell International, said that his DP experience tells him that DP managers will ultimately win out over the telephony types because those in control must know not only communications, but data bases, local-area networking, on-line processing and time-sharing applications.

"Both of these groups are now positioning themselves for communications control. However, DPers already know a great deal of the necessary technology for successful information communications," he said.

Kotler noted that although DPers are strong in the area of DP communications, companies will require communications to handle more than just data transmissions, meaning DP managers must be aware of those needs as well. He said information, or what he prefers to call "intelligence," will be a combination of types of information. "DPers will have to know the concepts of transmitting voice and video as well as data," he said.

A primary method of communicating this intelligence will be private corporate networks. The executive said communications DPers will be faced with private corporate communications networks, which will be owned by companies as fixed assets.

(Continued on Page 54)

Package Aids File Transfer

IBM Micro Gets Network Link

WOODLAND HILLS, Calif. — Protocol Computers, Inc. has introduced a software package that reportedly permits the transfer of files between an IBM Personal Computer diskette and an IBM Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) mainframe.

The PC 78B7+ allows files from an IBM host routed to the Personal Computer to be stored in the micro in either printer format or a continuous data stream. The Personal Computer can go back to the host for more information as needed, a vendor spokesman said.

The company has also introduced two Ascii-compatible CRT terminals — the PCI 78 and PCI 51. Both models feature detachable keyboards, tilt and swivel displays and auxiliary printer ports.

The file transfer software is available for $200 and each Ascii terminal is available for $995. More information is available from Protocol Computers, Inc., 6150 Canoga Ave., No. 100, Woodland Hills, Calif. 91367.

Color Terminal Emulates 3279-2A

SAN DIEGO — Term-Tronics, Inc. (TTI) has introduced a color CRT terminal said to emulate the IBM 3279-2A terminal and which is available for both stand-alone and cluster applications.

The Model 3270-9A/B also emulates the Lear Siegler, Inc. ADM-3A or a Digital Equipment Corp. VT100 terminal. It communicates simultaneously with an IBM and an asynchronous host via separate communications ports and screen buffers, according to the vendor.

The company has also introduced a 12-port Binary Synchronous Communications (BSC) controller. It is said to support up to 12 TTI 3270-A/B multiprotocol display stations and 12 separately addressable Ascii printers which emulate the IBM 3287.

The display station is available for $3,495, the controller for $2,995 from Term-Tronics, Inc., 7408 Trade St., San Diego, Calif. 92121.

X.25 Net Interface Processor Out

VIENNA, Va. — GTE Telenet Communications Corp. has unveiled a small-scale X.25 network interface processor for access to public or dedicated packet-switched networks.

Called the TP3005, the unit is designed as an economical concentrator for four asynchronous terminal or host computer connections, the vendor indicated.

The TP3005 supports CCITT international recommendations for asynchronous terminals, (X.3, X.28, X.29) as well as Telenet enhanced parameters, according to a vendor spokesman.

The TP3005 is fully supported by the company's network control facilities. Capabilities include remote configuration, down-line loading, alarm reporting, remote diagnostics and accounting information on a port-by-port basis, according to the vendor.

The purchase price of the TP3005 is $2,350 and includes a three-year software license. A maintenance agreement covering hardware and software is available at $40/mo, and Telenet network control center support at $60/mo.

Further information can be obtained from any GTE Telenet marketing office or from GTE Telenet corporate headquarters, located at 8229 Boone Blvd., Vienna, Va. 22180.

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Package Helps Micro Emulate CPU Terminal

MORRIS PLAINS, N.J. — Monroe Systems for Business has introduced communications software that reportedly enables its personal microcomputer to emulate a mainframe terminal.

The 3270 Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) was designed especially for the Monroe OC 8820 occupational computer aod includes a BIS-3270 Binary Synchronous Communications emulator that acts as an IBM 3271 controller with a 3277 terminal, a 3274 controller with a 3278 terminal or a 3275 or 3276 controller, according to a vendor spokesman.

Monroe communications packages operate at data rates up to 19.2K bit/sec with common carrier leased or switched telecommunications facilities for maximum efficiency. The communications series will be available in two versions, one based on Monroe'a own operating system and the other based on Digital Research Inc.'s CP/M operating system, added the spokesman.

The 3270-SNA/SDLC will be priced between $900 and $1,200. More information is available from Monroe Systems for Business, based at The American Road, Morris Plaina, N.J. 07950.

Console Provides E-Mail, Voice

FORT COLLINS, Colo. — Basic Telecommunications Corp. has introduced a communications workstation said to provide electronic mail, telephone, voice mail and a compact desktop console.

Datavoice reportedly allows the user to send and receive messages at any time; to review jointly data during a telephone conversation with remote offices; to retrieve information from host computers or data bases; to compose, edit and print memos and reports; and to dial phone calls automatically.

The price for the Model 10 version of Datavoice is $2,150; for the Model 20, $2,495. Basic Telecommunications Corp. is located at 4414 E. Hamony Road, Fort Collins, Colo. 80525.

Modem Announced

PHOENIX — Omnitec Data, Inc. has announced an autodial, full-duplex modem. The 8212 features a stored number directory of up to 10 numbers, automatic redial of last number called, speed dialing from memory, complete local and remote diagnostics and user-programmable hang-up code. The Model 8212 has an intelligent interface on the data terminal equipment side with autodial capability and operates in the answer mode for unattended operation, the vendor said.

Priced at $650, the modem is available from the vendor at 240S S. 20th St., Phoenix, Ariz. 85034.

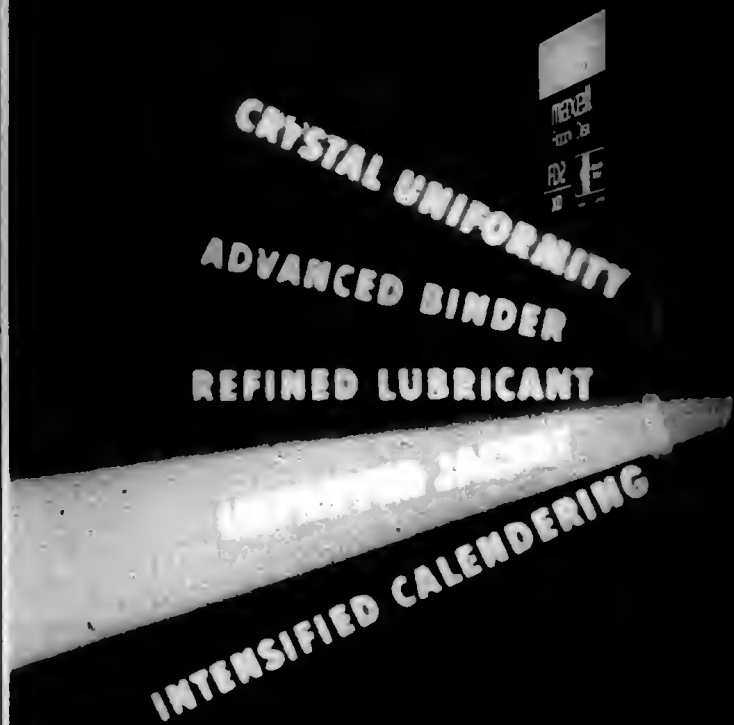
Banks Gain Interface

LITTLE ROCK, Ark. — Arkansas Systems, Inc. has announced the Switch Monitor to interface banka using the IBM System/34 computer to on-line automatic teller machine (ATM) networks.

Switch Monitor includes customization of software to the user's application files whether the files are generated in-house or from a remote processor, a company spokesman said.

The firm also supplies software for direct attachment of ATMa to System/34s. Neither product requires an intermediate computer for the interface, the vendor claimed.

Switch Monitor ia priced at $11,000 and is available from Arkansas Systems, Inc. at Suite 202, 8901 Kanis Road, Little Rock, Ark. 72205.



Z80 Users Get Accelerator

Bridge Users Get Phonelink

BERKELEY, Calif. — Virtual Microsystems, Inc. has announced Phonelink, a utility for The Bridge, the firm's virtual CP/M package for Digital Equipment Corp. minicomputers.

Phonelink facilitates use of microcomputers as part of a larger virtual system. Users can build and edit programs and files locally and transmit them over RS-232 lines to and from their DEC systems, according to a spokesman for the vendor.

The package costs between $750 and $1,250, depending on the DEC processor configuration, according to a spokesman for the vendor.

The firm also announced a hardware accelerator, the Z-Board, which incorporates up to four Zilog, Inc. Z80 microprocessors, up to 256K bytes of random-access memory and a bit slice state machine.

The unit costs between $1,250 and $1,780, depending on the DEC processor configuration.

Virtual Microsystems is located at Suite 720, 2150 Shattuck Ave., Berkeley, Calif. 94704.

Processor Emulates IBM BSC Controller

MIAMI — Innovative Electronics, Inc. has introduced a stand-alone, self-powered, micro communications processor said to allow full emulation of the IBM 3277/3278 Information Display Systems using a Televideo, Inc. 920, 925 or 950 terminal.

The unit communicates to an IBM host using 3270 Binary Synchronous Communications (BSC) protocol. It emulates an IBM BSC controller with one or two ports available for any combination of display stations or printers, a vendor spokesman claimed.

Other capabilities include replacing or multidropping with IBM 3271 Models 1 and 2, IBM 3276 Models 1 and 2 or IBM 3274 Model 51C control units, according to the vendor.

One BSC port and CRT terminal or printer port is available for $1,495. The two-port configuration is available for $1,695, plus an additional $300 for the modem sharing option, the spokesman said.

Innovative Electronics, Inc. is located at 4714 N.W. 165th St., Miami, Fla. 33014.

Miniprinter Announced

SUNNYVALE, Calif. — An intelligent, microprocessor-based telecommunications miniprinter has been announced by Advanced Communications, Inc.

The MP 2000, a 20-col. thermal printer, features an integral Bell 103 Ascii modem Frequency Shift Keying modem for communications over any dial-up phone line. The modem operates at a rate of 300 bit/sec, a vendor spokesman said. Unattended, automatic answering on the first or fourth ring allows incoming messages to be printed at 30 char./sec, 24 hours a day, the vendor said. The Federal Communications Commission registered printer plugs into any standard RJ11 telephone jack and does not require special installations.

The MP 2000 is priced at $445, Advanced Communications said from 462 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Series 500 Gets Control System

MAYNARD, Mass. — Data Terminal Systems, Inc. has announced the addition of an inventory control system to its Series 500 family of point-of-sale terminals.

The Model 555 is said to offer gross margin, reorder and on-hand and physical inventory reporting for up to 12,000 items. The system reportedly is compatible with Universal Product Code and optical character recognition scanning equipment.

Base price of the Model 555 is $3,395 from 124 Acton St., Maynard, Mass. 01754.

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Terminal Allows Users To Reconfigure System

ANN ARBOR, Mich. — Ann Arbor Terminals has introduced a CRT terminal that allows users to reconfigure the system for different software, I/O systems and applications.

The Genie+Plus display terminal can be changed from a conventional 24- by 80-char mode unit to a 30-line terminal with multiple page and window capability, to a highly structured, off-line form-filling terminal with protect, guard, numeric, justify and security areas, a vendor spokesman claimed.

The terminal is available for $1,395 from Ann Arbor Terminals, Inc., 6175 Jackson Road, Ann Arbor, Mich. 48103.

Genie+Plus

Satellite Exec: DPers in Charge

(Continued from Page 51)

"Every Fortune 500 company with communications needs of over 500 miles will eventually own their own communications capabilities," Kotler observed. "Corporations want to own their own networks as assets because many spend an average of 2% to 4% of their revenues on communications. It is much more desirable to have a network as a fixed cost so concrete plans for growth can be made."

Central Satellites

Kotler sees the satellite as central to this kind of network. "The satellite is to the computer industry today what the jet engine was to the airlines some years ago," he said. He explained that the satellite offers companies the fastest and safest method of communication and can be cost-effective as well. "Corporations can send their combined types of information to the satellite and have it beamed quickly to a private earth station near their facilities. The need for long land lines is cut out and much of the reliability problems are eliminated," he stated.

Until now, satellites have been primarily used for telephone and entertainment capabilities because of the high cost of owning a transponder, the part of the satellite system which switches communications signals. Kotler said that his company will be supplying fractional transponder space to companies, making it financially feasible for them to operate their own communications networks.

USSSI has taken the first step in offering these capabilities through what Kotler calls an "information distribution utility." He referred to the recent joint marketing/technological exchange agreement made with Wang Laboratories, Inc., [CW, Dec. 13] that will allow Wang accounts to participate in their own national communications network of Wang-based systems with voice, data, video and text transmission as the beginning of such a distribution utility.

Kotler said USSSI will launch its high-frequency Ku-band USAT-1 satellite in November 1985, and USAT-2 in June 1986. The company will also offer communications facilities management and consulting services to firms that require them, he concluded.

MPC Announces Smart Terminal Line

STERLING, Va. — Micro Products Co. (MPC) has introduced a series of smart editing CRT terminals said to feature ergonomic design, enhanced video attributes and flexible screen formats.

The MPC 1100 reportedly emulates the Perkin-Elmer Corp. 1251 and costs $1,695, the MPC 1200/1250 series is said to deliver full functionality of the Digital Equipment Corp. VT131, VT132 and VT125 series and costs between $1,795 and $3,495.

The MPC 2100/2150 series is an advanced color terminal for graphics and alphanumeric editing and costs between $2,995 and $4,395, the vendor spokesman said.

All of the terminals feature an expanded 14-in. nonglare screen in a housing that tilts 15 degrees and swivels 60 degrees. A detachable low-profile keyboard controls such characteristics as display brightness and color, the vendor said.

More information can be obtained by contacting Micro Products, through P.O. Box 198, Rt. 634 and Acacia Lane, Sterling, Va. 22170.

Graphics Terminal Announced by HP

PALO ALTO, Calif. — Hewlett-Packard Co. has introduced a color graphics terminal said to offer vector graphics and complete alphanumeric capabilities.

The HP 2627A is designed for business and technical graphics such as presentation graphics and data analysis. The terminal's 12-in. screen has a nonglare, high-contrast display with a graphics resolution of 512 by 390 pixels.

It is a raster terminal with eight basic colors. The colors can be mixed to create additional colors, some of which have been redefined to HP's plotter pen colors, a vendor spokesman said.

The terminal is available for $5,975 from Hewlett-Packard, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Apple II Gets Line Monitor

MINNEAPOLIS — Metatek, Inc. has announced a low-cost data line monitor designed to operate on an Apple Computer, Inc. Apple II personal computer system.

Metascope consists of a printed circuit board, documentation and all software necessary to turn an Apple II computer into a fully programmable data line monitor, the vendor said. The unit is capable of displaying and storing data in asynchronous, byte-oriented synchronous or bit-oriented synchronous High-level Data Link Control/Synchronous Data Link Control modes at speeds to 19.2K bit/sec.

Other features include the ability to start data recording based on a trigger pattern match, storage of data on diskette and a programmable host emulation mode that allows the Apple II to act as a sophisticated communications controller.

The retail price for Metascope is $895. Sales and distribution are being handled by Parity Products, 3900 Crestview Drive, Minneapolis, Minn. 55331.

Gets DEC DMF-32 Capability

CS11, CS21 Mux Series Enhanced

SANTA ANA, Calif. — Emulex Corp. has introduced enhancements to its CS11 series and CS21 series of communications multiplexers. The enhancements are said to offer the multiplexers the capabilities of the Digital Equipment Corp. multifunction I/O controller called DMF-32.

The enhancements, called the CS11/F and the CS21/F, are said to be fully software transparent and to operate in the DEC VAX-11 environment with the VMS 3.0 or higher version operating system.

DMF-32 capability offers eight asynchronous lines, one synchronous line and one parallel I/O port. Only two of the eight asynchronous lines need modem control for remote telecommunications.

A 16-line CS11/F lists for $4,500 and a 16-line CS21/F lists for $3,500 and are available from Emulex Corp., 2001 E. Deere Ave., Santa Ana, Calif. 92705.

Interface Out For TI Series

DALLAS — Texas Instruments, Inc. has introduced an asynchronous interface designed to attach printers, terminals or modems to its Business System Series 600 or 800 computers.

The Communications Interface 402 is said to provide an interface to two 9,600 bit/sec asynchronous devices compatible with RS-232C or V.24 protocols. The CI402 is said to replace a single-channel TTY/EIA card. Compatible interfaces include the TI Series 300 two-channel interface, the Series 300 processor port and the Series 600 processor port.

The interface is available for $495 from Texas Instruments, Inc., P.O. Box 202146, Att: H-641, Dallas, Texas 75220.

Smartbuffer Introduced

DORAVILLE, Ga. — Data-Match Corp. has introduced a buffer unit said to support up to four inputs and four outputs at the same time.

The Smartbuffer allows several computers to transmit data to shared outputs. It has an expandable internal memory of up to 256K bytes.

It will also allow users to print general ledger, monthly reports and 20-page manuscripts while leaving the computer free for other projects. It can store up to 10 pages and transmit to a printer at 200 to 400 word/min.

The buffer ranges in price from $335 to $1,100 and is available from Data-Match Corp., 3810 Oakcliff Industrial Court, Doraville, Ga. 30340.

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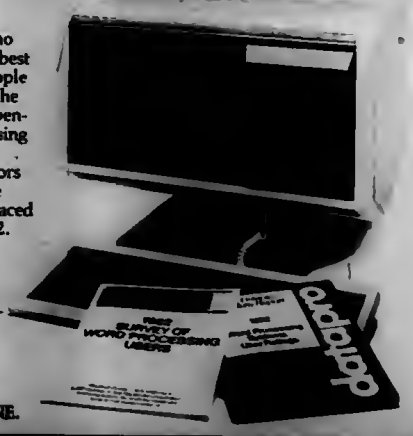

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Graphics Package Out for VT-100s

SACRAMENTO, Calif. — Digital Engineering, Inc. has introduced a graphics conversion package for the Digital Equipment Corp. VT-100 family of terminals.

Designed and programmed with 32K bytes of local software, the DQ650-series "Gen.11 Retro-Graphics" enhancement provides bit-mapped imaging and emulation of the Tektronix, Inc. 4010 graphics terminal and monochromatic emulation of the graphics functions of the Tektronics 4027 color graphics terminals, the vendor said. It also emulates the graphics functions of the Tektronics 4014.

A version of the software with 800 by 480 pixel resolution — the DQ650M series — is also available.

The DQ650 costs $1,230 and the DQ650M package ranges in price from $1,560 to $1,715.

Digital Engineering, Inc. is located at 630 Bercut Drive, Sacramento, Calif. 95814.

Graphics Support Units Unveiled

MOUNTAIN VIEW, Calif. — Kaufman Research Manufacturing, Inc. has introduced a graphics support feature said to provide support of asynchronous graphics terminals running on IBM and Sperry Univac systems.

Designated 870G and 871G respectively, the protocol converters are both polled concentrators and terminal emulators. Up to eight terminals may be attached to each unit, a vendor spokesman said. Line speeds of up to 19.2K bit/sec are reportedly supported.

The systems feature support of both black-and-white and color graphics while retaining compatibility via the emulation of the IBM 3270 and Univac UTS 40 series of terminals.

The price of the graphics support ranges from $8,000 to $10,000 for either the IBM or Univac versions, depending on the number of ports.

Kaufman Research Manufacturing, Inc. is located at 145 E. Dana, Mountain View, Calif. 94041.

DMG/Net Gains Interface for DEC

WILLOWDALE, Ont. — Digital Management Group Ltd. has announced that DMG/NET networking software for Digital Equipment Corp. PDP-11 RSTS/E systems now interfaces with Racal-Vadic, Inc. and Ven-Tel, Inc. autodial units.

In a typical DMG/NET configuration, an autodial modem is connected to a DEC computer terminal port. The software is configured for all required destinations and the user can access any destination by typing a short abbreviation at the terminal. DMG/NET establishes the connection to the remote computer, and if the main number is busy, it will automatically seek alternatives, the vendor said.

Prices for the software start at $1,500 from Digital Management Group Ltd., located at 4800 Yonge St., Willowdale, Ont., Canada M2N 6G5.

SBSB Introduces Worldwide Net

WORCESTER, Mass. — A World-Wide Computer Network from Small Business Service Bureau, Inc. (SBSB) reportedly allows small-business personnel to send and receive information, data, electronic mail and computer programs.

Available to all 35,000 SBSB members, the network serves cottage industries, self-employed business professionals, sales agents or any small-business member company.

Game computers, terminals or business computers can "talk" through the network 24 hours a day to most U.S. locations and many locations throughout the world. Users must have SBSB membership, which costs $50/year. There is a $5/mo minimum account charge for the network, with additional costs on an as-used basis, a spokesman said.

SBSB is located at 544 Main St., P.O. Box 1441, Worcester, Mass. 01601.

Interfaces Out For DG Minis

WESTBORO, Mass. — Two interface packages meeting the IEEE-488 digital interface standard for programmable instrumentation have been announced by Data General Corp.

The packages for the DG Nova and Eclipse minicomputers include the functions of controller, talker and listener.

More than 1,000 different instruments from various vendors can be connected to the controller without special engineering, a vendor spokesman claimed. The interfaces support both programmed and data channel I/O modes.

The IEEE-488 Micronova Interface (Model 4516) is available for $1,150 and the IEEE-488 Nova/Eclipse (Model 4517) is available for $1,850, according to the vendor.

The initial license fee for each software package is $450. DG is located at 4400 Computer Drive, Westboro, Mass. 01580.

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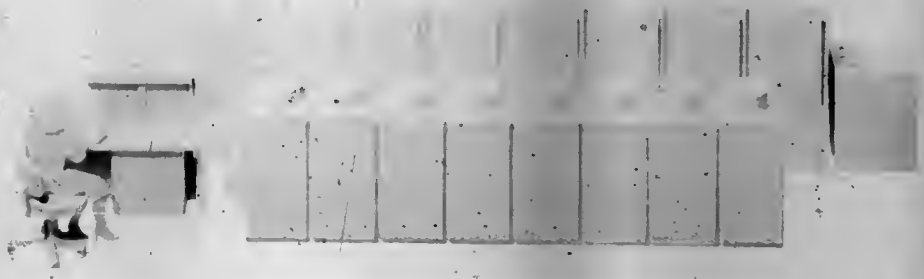


The Tandem NonStop™ Network

Components fail. But that doesn't necessarily have to mean downtime. With a NonStop network from Tandem, you're assured of completely reliable system operation—right through a component failure that would shut other systems down. The result is that you get the right information to the right people at the right time. Across the street or around the world. Without fail.

The network is based on the continuous processing capabilities of Tandem NonStop computer systems—a fault-tolerant environment in which a malfunction or component failure will not inhibit or interrupt system operation.

With a Tandem system, you can access information from anywhere in the network, in different formats (text, data and images), integrate all the information in a form that meets your specific requirements, and distribute the finished product at the appropriate times to any number of recipients at any number of locations. Those receiving the communication can 1) interactively add or delete information; 2) forward it to other individuals or send it back to the originator; 3) print it out; or 4) store it for future reference. Or any combination.

And in a Tandem network, all the advantages of NonStop system availability become NonStop network availability. If a line failure occurs, our advanced networking software transmits the message over the optimum alternative path—transparently to the user, of course.

But the result is always the same: your information gets through. Without fail.

DEVELOPING THE INFORMATION

As the nature of doing business on a large scale becomes ever more complex, so does the nature of the information behind it. Not only is this information in many different formats, it is typically widely dispersed throughout an organization. With most systems, that means throughput problems for those users in remote locations who need only occasional access to it.

Not so with Tandem.

The wonders of a distributed, relational database.

Unlike other approaches to distributed processing in which each location functions as an independent database, Tandem treats the network as one single database with multiple files distributed geographically. Programs will run with files from anywhere in the system, whether you have a single two-processor system or a 255-system network. And with no user intervention or special programming required.

The key is the relational organization of the database—an extremely flexible design concept that's also extremely easy to work with. Setting up files merely involves creating or filling in tables with pertinent data. So you save time and money right from the start on program development and maintenance. And to expand, you merely add new tables or add more rows to existing ones—without rewriting or modifying your applications programs. This lets you concentrate on the application at hand, not on system organization.

MOVING THE INFORMATION

Most business information systems are configured for the purpose of automating the tasks normally associated with office work: writing, printing, filing and distributing information within a local area.

But communicating this information in a timely, reliable manner outside that area is another problem entirely. If you don't know beforehand precisely which locations are to be included in your network, you'll pay a stiff penalty in reprogramming and restructuring costs when you want to add nodes or change them around.

That's where the Tandem difference is so important.

Rings. Strings. Stars. Or any combination.

The Tandem system was designed from the start to be a single, flexible network. No matter what the configuration. Or how many times you change it. A simple two-processor system at one physical location may be thought of as a network, just as a 255-system configuration spread across the globe is a network. The very same network, at that. This concept of a *total* information/communications system results in significant time- and cost-saving benefits for the system designer. And ultimately, for the user.

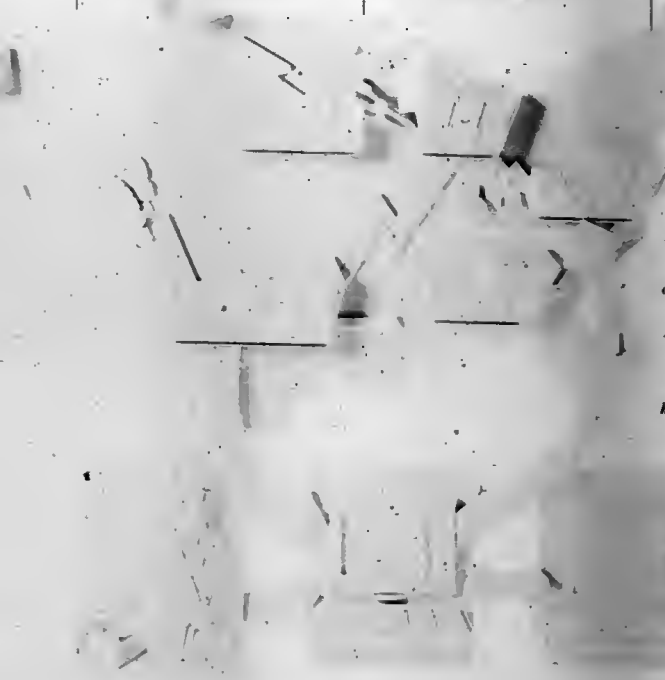
Plenty of room to grow.

System expansion is easy and economical. Thanks to the network's modular construction, moving up to larger configurations is simply a matter of adding hardware, piece by piece, as requirements dictate. You start only with what you need, and add processors, peripherals and communications facilities in low-cost increments. And without having to rewrite a single line of software. That means your original investment in equipment and programs is always protected.

The right information to the right people at the right time.

The Tandem NonStop network integrates all devices into a single virtual system. This provides a framework for information handling that is independent of both content and

time. Each user can send, query, receive, store, secure, forward and distribute information at his or her own terminal. Including information from the database and images from a facsimile machine, and the user's own ad hoc memos. The system assures that the information will reach its destination at the user-specified time. And that's what effective communication is all about.



On a Tandem network terminal in the Dallas office, a sales representative accesses the corporate database to draft a quote document for presentation to a customer in London. Meanwhile, the San Francisco and Chicago offices respond to a separate "electronic memo" by sending charts on the customer's sales activity and copies of faxed news stories and photos. After product inventory figures from the Atlanta warehouse are added, the complete report is transmitted to corporate headquarters in New York, where the document is reviewed and a cover letter drafted. Finally, with a few simple keystrokes, the entire package is sent in seconds to the London sales office, with copies to New York and Dallas for storage on file. Thus, the full resources of the system are put to work for effective corporate information management.

THIS NETWORK WORKS

Tandem processors complement each other, working together to increase power, performance and throughput for a lower total cost per transaction. Adding NonStop fault-tolerant operation to advanced networking capabilities, the Tandem system virtually eliminates the risk of network failure. At the same time, it protects the database from damage caused by electronic malfunctions. And when a component does fail, the system can be serviced —parts removed and replaced— while continuing to process transactions. So your message is guaranteed to get through. On time, every time. And over the widest range of communications circuits, too: X.25 packet-switching networks, terrestrial circuits, fiber optics, even satellite links.

The ins and outs of transmitting data.

Tandem's comprehensive set of communications products protects your investment in other mainframe, mini, and peripheral products. The Tandem system supports BISYNC, ASYNC, SDLC and HDLC basic communications protocols. There are also a variety of software packages that allow a network of Tandem systems to be linked to other mainframes or networks (including SNA) for the support of interactive processing and remote batch processing.

In addition, the Tandem system can be interfaced to a wide range of terminal products such as text processors, ATMs, cash registers, badge readers, optical scanners and shop floor terminals.

Words and images.

Tandem's special facsimile software lets you store and forward facsimile reproduction of charts, graphs and diagrams to accompany text from various data files. And, you can access this information from any telephone with a facsimile machine. What's more, this ability to transmit graphic elements also greatly enhances our unique Query/Report Writer capability —the only such software on the market that optimizes both functions over a distributed database.

The speed of light.

Using state-of-the-art optical technology, our high-speed fiber optics extension provides the means to link Tandem processors up to a distance of 1000 meters between individual systems.

In effect, you can link up to 224 processors within your headquarters or plant, giving you an extremely fast and efficient system that provides enormous processing capability. And of course, you can interconnect this system into your network for expanded information-sharing capabilities.

The sky's the limit.

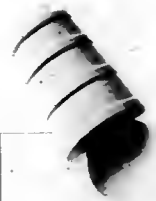
The lower costs and higher reliability of transmitting data over long distances via satellite is an economical and practical alternative for any corporation with geographically dispersed locations.

That's why Tandem has joined with American Satellite Company (ASC®) in a unique marketing agreement to provide the only completely fault-tolerant satellite communications network on the market today. So you can be assured of total NonStop system reliability, from operating system to orbiting satellite.

Following the NonStop system strategy, earth stations transmit and receive data over two parallel paths—if one is down, the other is still operational.

Also, ASC provides two different transponders on the satellite itself. Again, should one be inoperative, the second transponder and data path continue to function.

ASC provides the earth stations, including a special antenna that is small and light enough for mounting on a rooftop or in a parking lot. This can be directly connected to the computer system, without need of leased lines, for lower costs and



higher dependability. Tandem supplies all other ground components, including controllers, RF modems and complete computer/communication interface modules, all of which were designed with solid state technology for outstanding reliability. And, since Tandem maintains the entire system, you always have only one number to call for the answer to any question.

Putting it all together.

With a full range of communications capabilities and the enormous capacities of a global system, the Tandem NonStop* network is uniquely suited to the complete information requirements of multi-divisional, multi-national corporations. And most especially for any business or institution that needs to get the right information to the right people at the right time. Without fail.

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A single operating system.

A single database.

A single operating environment.

A single network architecture.

A single application environment.

The Tandem Evolution—our original design concept, still big enough to contain the past, handle the present and include the future.

The Tandem Evolution—an evolution in products and strategy that integrates information and communications in a single virtual NonStop system. A system with the flexibility to adapt as time, markets or economic considerations change. A reliable network that links people, equipment and data independent of location, application, form of data, method of transmission, number of users or types of equipment. An evolution that from beginning to end protects your investment in information resources.

The Tandem Evolution—a consistency in philosophy that's designed to give users the optimum in computer performance right now. While providing a continuing, flexible framework for enhanced performance tomorrow.

Tandem provides local sales and service support in the major computer markets throughout the free world. Plus fourteen software education centers in the U.S., Canada and Europe offering professional technical training courses for your programmers and analysts. With this kind of support behind each new capability, applications can be implemented on-line quickly, easily and economically.

If you'd like more information, call your local Tandem sales office listed on the back cover. Or contact Tandem Computers Incorporated, 19333 Vallco Parkway, Cupertino, California 95014. Toll Free 800-538-3114 or (408) 725-6000 in California.

The system shown is a sixteen processor system. It can function independently or as the local node of a 255-system network, more than 4,000 processors, providing direct and immediate access to information sources anywhere in the world.

When you need it without fail, there is only one.

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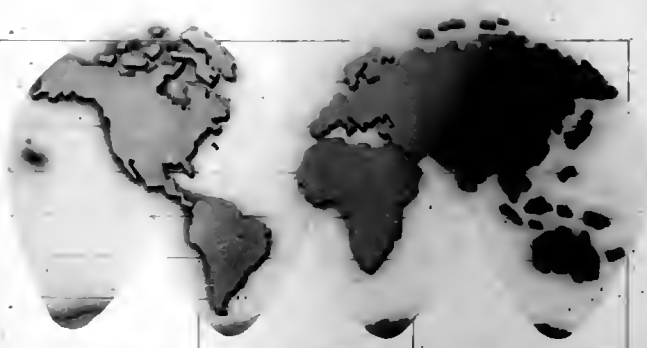

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High Technology Comes of Age in the Emerald Isle: A Firsthand Report

By Henry and Elizabeth Urrows

Who should be interested in Ireland's high-technology boom? You should, especially if you work at a multinational company. Or, if your personal aspirations and concerns go beyond immediate MIS duties, you can profit from [illegible] experiences in attracting, developing and keeping highly qualified people — motivating them toward practical innovation and constantly improving hardware and software production. And, through cost-effective manufacturing practices, high-technology firms in Ireland are meeting ambitious profit objectives.

On a recent tour of Ireland's high-technology industries, we learned that the country has outworked competing nations in attracting companies that export effectively — firms that are resources for equipment and service support of what is fast becoming inexpensive, reliable internal and worldwide corporate communications.

The explosive growth of data processing and telecommunications manufacturing in the Republic of Ireland is maturing, led by U.S. companies with European and Japanese firms following rapidly. Ireland's component assembly operations of the early '70s, fortified by careful quality control and low costs,

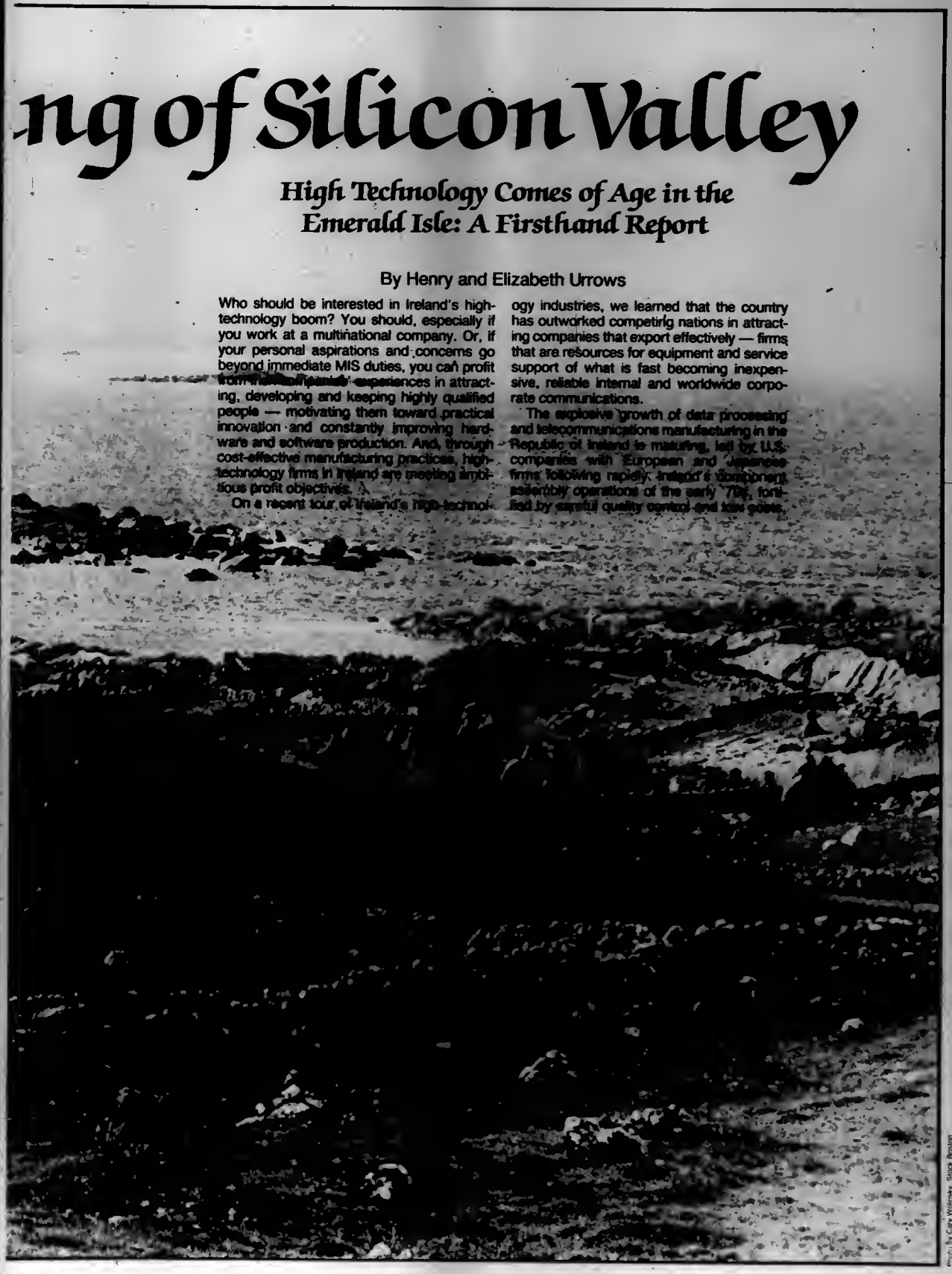

Photo by Cary Wolinsky, Stock, Boston

are giving way to design and manufacture of new hardware, software and research into new applications.

New Investment

U.S. corporations have dramatically increased their investments in Ireland over the past 10 years. By one tally, they have sown about 265 industrial and commercial installations there. In the two decades from 1950 to 1970, American industries invested about $500 million in the Irish Republic. During the following 10 years, they multiplied that stake sixfold, putting in almost $3 billion more.

Ford Motor Co., General Motors Corp., Gulf & Western Industries, Inc., Ingersoll-Rand, Kollmorgen Corp., Rockwell International Corp. and Westinghouse Corp. are all in Ireland. Digital Equipment Corp. was the flagship of the U.S. computer industry in Ireland when it began operations there in 1972.

A major attraction for U.S. firms is Ireland's full membership in the European Common Market, which it has held since 1973. The country is therefore a base for duty-free access to markets where more than 260 million Europeans live, work and consume.

With 10 countries full members of the European Economic Community (EEC) and two more applications pending, why Ireland? American managements are more comfortable when dealing with English-speaking people, even though British and Irish uses of the tongue recall George Bernard Shaw's verdict that the U.S. and Britain are separated by their common language. (Our prevailing national American disinclination to master foreign languages is wastefully expensive, just as our ignorance of the Brussels Convention regulations sharply cuts the U.S. ability to export goods and services competitively.)

Ireland competes to get what we can bring to Europe. Until recently it offered a 10-year tax holiday on export profits — 100% tax relief until 1990. Its nonrepayable cash grants can be as high as 50% of the cost of fixed assets and the entire cost of training new employees, including management training in the U.S. Since Jan. 1, 1981, the Irish corporate tax rate has fallen from 45% to a new maximum tax rate of 10%. This ceiling is guaranteed to last until the year 2000.

The U.S. Department of Commerce August 1981 annual survey of U.S. investment overseas reported that between 1977 and 1980, U.S. companies obtained an annual average 33.7% rate of return on manufacturing investment in the Republic of Ireland. That was twice the rate in the then nine EEC countries (16.8%) — and more than double the world average.

In the same four-year period, U.S. investment in Ireland grew an average of 41% each year. That was three times faster than the 13.9% EEC average.

The result has been that even though all overseas firms in Ireland have total freedom to repatriate all their profits, many have kept increasing their investment there. General Electric Co. began work at its first Irish plant in 1963, then others in 1966, 1976 and 1981. Westinghouse has produced at eight plants since 1976. DEC now has two hardware manufacturing facilities and one software plant in Ireland.

Tax Incentives

We wondered whether firms that have entered Ireland might pull out after the 10-year tax holiday on exports. Dan Coffey of Ireland's Industrial Development Authority (IDA) said the holiday only applies to companies that were in Ireland before 1981. That carrot is now supplanted by the 10% maximum tax on profits for all manufacturing to the year 2000.

"The European Economic Community and our major competitors like England, Belgium and Italy were very unhappy with us. As far as they were concerned, we were breaking the Treaty of Rome, which had created the EEC, because our attractions discouraged companies from going to their locations. When the EEC Commission took us to task," Coffey recalled, "the way they put it was that our taxation of overseas manufacturing companies discriminated

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At DEC's Clonmel site, Patricia O'Toole places an integrated circuit with guidance from a programmed laser beam.

against domestic producers serving our own market.

"The Irish government kind of outmaneuvered the EEC. It changed to a guarantee that taxation would not exceed 10% for everyone. That quieted our critics in Europe. It also made our domestic manufacturers very happy. So now we offer a maximum 10% tax, against which there are very generous depreciation allowances."

The Irish have also found ways to encourage start-ups for whom the prospect of large profits does not yet exist. "These new companies let the Irish banks buy all their capital equipment and lease it back to them at very, very low rates," Coffey continued. Irish company law regards the leasing arrangements as transactions between companies, allowing the leasing parties to convey to the banks their deductibility. The banks thus benefit from the manufacturers' tax benefits.

"We pay 100% of agreed training costs," Coffey added. "That is a tremendous advantage. So far as we know, no other European industrial location undertakes to do it. Many of the American and Japanese companies have sent their Irish technicians to their home countries to be trained." We noted such major corporations from Japan in Ireland as Asahi Chemical, Fujitsu, Mitsui Mining & Smelting and Nippon Electric.

Foreign Investment

A tally of overseas investment in Ireland by countries for the 1972-1979 period showed the U.S. led the pack with $5.54 billion in constant 1979 prices, compared with $612.6 million from the UK, $447.4 million from the German Federal Republic, $272 million from Japan and $1.392 billion from all other nations.

Eight hundred overseas companies employ an estimated 85,000 people in Ireland today, according to Coffey. IDA encourages companies to reduce costs so the operations are more likely to stay and grow. If companies "sink roots in Ireland," as he puts it, they will create employment elsewhere in the economy.

IDA's fall 1982 report of current employment by the top 11 electronics companies in Ireland had three U.S. companies in the lead: DEC with 1,300 workers making minis. GE with 1,200 for components and Westinghouse employing 1,000 on a variety of products. Sweden's L.M. Ericsson had 700 in Ireland producing telecommunications equipment.

Dataproducts Corp. had 600 making printers; Storage Technology Corp., 550 making printers and drives; Telectron, 500 producing telecommunications equipment; Verbatim Corp., 350 for flexible disks; Wang Laboratories, Inc. with 350; Analog Devices, Inc., 300 producing integrated circuits; and Nixdorf Computer Corp., 300 making minis.

Local Talent

Enticing grant and tax concession packages notwithstanding, managers of U.S. installations in Ireland told us that a strong drawing point for them is the ability of the Irish people, who are rigorously trained, hungry for jobs, eager to work and to earn.

Ed O'Connell, manager of the DEC International Ltd. plant on a breathtaking site in Clonmel, Tipperary, gave us a breakdown of the 190 employees who worked there in mid-November 1982.

O'Connell, a graduate of Britain's Farnborough College of Technology, had been a manufacturing engineer for eight or nine years in England before joining DEC's then new operation in Galway. The Clonmel installation now employs 90 people doing direct production tasks as well as 100 support people. About 40 of the latter have Third Level educational credentials. A majority of the engineers have First Class Honors degrees in electronics.

"Our industry is technologically driven. Change to us is as common as the products we are making on the floor," O'Connell said, emphasizing that "we need people able to handle that degree of change without feeling uncomfortable.

"We have hired many first-class technologists," he continued, "be they engineers, MIS people or managers who would have little formal qualification, but they do have a great deal of experience in this specific industry. We saw an attitude which we wanted to hire, and we saw an ability to handle change and be comfortable with it."

DEC's Clonmel operation, now four years old, has implemented quality circles. Two years ago, O'Connell decided that it was necessary to break away from "the very heavy vertical organization" within the plant, where people talked primarily to their subordinates and their supervisors and did little talking to the other people in the plant who perhaps "have a majority shareholding in solving problems, introducing new products or in implementing office automation."

Photo by George A. Bowen

Patricia Hayes assembles a DEC power supply. She is working at a powered turntable adapted from a Swiss unit for assembling watches.

The staff brought in what they believed was the world's foremost consultant on quality circles for a concentrated three-day session for this extension of the participative approach. They next involved core center managers and supervisors.

O'Connell now feels his highly

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trained staff helps formulate strategy and tactics necessary to meet what they believe will be the outside competition. He says they delegate the operation of the plant "within the bandwidth of goals to be achieved" to the center managers and supervisors.

"They saw the opportunities that were being opened up to involve many more people in solving the day-to-day problems. That allows the staff and myself to go away to solve the problems that are going to be major roadblocks to our future," O'Connell said.

One senior engineer and a software specialist told us that virtually all their work is on innovations. In the automated plant, the production people do all the manufacturing and inspection for quality control.

While it may be true that engineering talent is abundant in Ireland now, when DEC went there a dozen years ago, most graduates from the universities' engineering colleges had to find work outside their country. And effective top management people are much sought after. DEC is proud that it has lost only two senior managers in four years — one to manage Wang's operations in Ireland and the other to Analog Devices.

Ireland's Industrial Development Authority predicts that the number of people employed in electronics, 16,000 in 1982, will double by 1985, when annual output for the Irish electronics industry should exceed $2.5 billion. Available candidates for jobs are among the youngest in Europe. About 50% of the labor pool in Ireland is under 25 years of age.

The facility's personnel turnover is running at an average rate of 3½% to 4% per year, reported on a monthly basis, according to O'Connell. DEC Ireland does not have a union, he added.

At CPT Ireland (see box on In Depth/7), all but three of the entire staff are Irish. Over the last 12 months they have put in 27% overtime — one reason why more are being hired. Personnel manager Noel Glennon said the applicants he had interviewed were above average in their preparation, although people with applicable industrial experience are hard to find. All but two now on the payroll had received training under IDA grants.

Production workers at CPT were 100% unionized under what Glennon said Americans might call a "sweetheart agreement." He said there are no problems: "There are claims, we negotiate them. We pay a good wage. It is not the highest, but it's good."

Attractions for Four-Phase

Executives at Four-Phase Overseas Corp. at the Mahon Industrial Estate in Blackrock, at the edge of Cork, find it advantageous to hire people with timely, pertinent university training and scant experience. Why did this software development affiliate of Four-Phase Systems, Inc., headquartered in Cupertino, Calif., and a wholly owned subsidiary of Motorola Inc., come to Ireland?

Aside from IDA's making their entry into the country very attractive financially, Four-Phase found that "it is getting extremely difficult to be a software developer in Silicon Valley," according to Peter G. Cook, Four-Phase senior director of applications development. Hiring people is the nub, he added.

"The number of companies is growing," noted Cook, who commutes between Cupertino and Cork. "Apple Computer, for example, is right across Saratoga-Sunnyville Road in Cupertino. And it is hiring, hiring, hiring. Any one of our people who wants another job doesn't have to pound the streets very long to get one, given that they have this rare and arcane talent. We decided that moving the development part out of Cupertino was a logical thing to do. I was hired about three years ago to develop a software shop in Portland, Ore. It has been quite successful, but that's only about 600 miles away from Cupertino.

"When the IDA opportunity came along, we thought, 'Let's go for broke. Let's try something several thousand miles from California.'" Cook is now responsible for software applications development that includes a group at Cupertino and others at Portland and Cork.

Ultimately, sales in the Common Market will be a factor, but "that's future." The sole Four-Phase goal in Cork now is to develop new software that it will sell back to the parent company. The company has hired two software designers from the UK, but the primary objective is to hire Irish professionals. Thus far, six designers are from Ireland. One reason for locating in Cork is the proximity of University College Cork and other educational institutions.

David Harrington, manager of Four-Phase in Ireland, told us that with the kind of work Four-Phase is doing in Ireland, the company prefers people who have been exposed to the latest academic theories, even when they have relatively less experience. "They have freshness, familiarity with the newest languages and newest operating systems. We are in a productive environment, [not merely] updating software that's been in the field four or five years.

"We're developing software on a 12- to 18-month cycle. When we need to find somebody who knows something about the latest software, we find it an advantage to have the universities close by," he said.

IDA states that the number of people employed in electronics, 16,000 in 1982, is expected to double by 1985, when annual output for the Irish electronics industry should exceed $2.5 billion. Available candidates for jobs are among the youngest in Europe. About 50% of the labor pool in Ireland is under 25 years of age. About 31% are under 15. Many of the young men and women we saw in electronics factories are in their early teens and show every sign of learning quickly.

David Hanna of IDA provided estimates that between 6% and 10% of Irish electronics workers are graduate engineers and another 15% to 20% are skilled technicians, the balance being production workers. Dan Coffey told us that Ireland is now "graduating 700 people with degrees in electronic and related engineering. With those from other scientific disciplines, the total is probably about 1,200 a year, and growing. Graduate degrees are about a third of that."

Ireland has five university colleges, nine regional technical colleges, two colleges of technology and two institutes of higher education. Three hundred technical training schools provide operator and craft training. Anco, the Industrial training authority, operates 13 industrial training centers, where 15,000 trainees qualify annually, and the authority plans to double this output.

IDA and Anco support in-plant training schools that teach toolmaking and operation of sophisticated precision machines. Students of the National Institutes for Higher Education (NIHE) at both Limerick and Dublin work in industry for one of their four years of study.

Four-Phase Overseas recently hired six Irish software designers in their early 20s, who later had six months' training in Cupertino.

"They are all potential winners. I think we have found some very bright designers," Harrington said. "I've interviewed a dozen people since coming here. All the Third

(Continued on In Depth/10)

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IN DEPTH

CPT Offshoot Blooming in Irish Soil

CPT Ireland leases a plant in Ballincollig, a bedroom suburb of Cork, the Republic of Ireland's second largest city. Founder-president Dean F. Scheff seized advantage of the report that Data 100 Corp. — whose headquarters is outside Minneapolis — was about to close its Irish operation in January 1980. Data-100, a Northern Telecom Systems Corp. subsidiary, had used the 44,000 sq-ft facility built five years earlier to assemble minicomputers.

Scheff drove a bargain with Ireland's Industrial Development Authority (IDA) he wishes the state of Minnesota would try to emulate because CPT is doubling its headquarters' work space there. IDA made grants for 35% of the cost of new equipment. By November 1982, CPT Ireland was processing its fourth grant claim, which should bring £230,000 in addition to the £90,000 already recovered and received. A training plan envisioned £347,000 in grants over five years. This has since been exceeded by roughly £100,000, according to CPT Ireland's finance officer, Donal Healy.

CPT, named after the first Cassette-Powered Typewriter, has come a long way since Scheff founded his company in May 1971 with a staff of two and cash scraped from his business equipment dealership to pay the five people who first developed his products.

In the fiscal year ended June 1982, CPT Ireland shipped $12 million worth of word processors and peripheral equipment and supplies. It projects for fiscal 1983 that at least $50 million worth will be produced by a work force whose number may rise to 120. That level of production approximates throughput of nearly half a million U.S. dollars per worker. Overall, CPT gets $106,000 per employee.

When Data 100 closed its Ballincollig plant, CPT's executive vice-president was able to hire all the Data 100 engineers and managers, thereby avoiding the need to recruit. CPT trained key people in Minnesota at IDA expense and was able to begin operations on June 1, 1980 with about 50 employees.

Of the 102 employees at CPT Ireland when we visited last November, 99 are Irish, two Scottish and one English. Three of the Irish employees had lived for long periods in the UK. (On our visit last fall, we met quite a few men and women who had returned to their native Ireland when they found paying work in electronics.)

The fourth quarter of the recessionary fiscal year 1982 ended June 30 was CPT's 40th consecutive profitable quarter. Revenues reached $145 million, 43% above 1981. Net income of $15.8 million was up 27%. CPT's eye is clearly on the future, judging from its investment of more than $20 million in such capital projects as computerized test gear and automated production equipment, much of which is replicated in the facility in Ireland.

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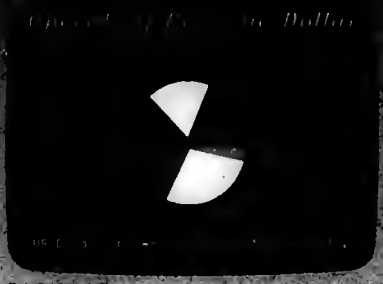

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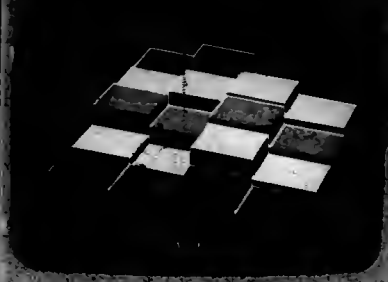

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(Continued from In Depth/6)

Level graduates, whether they are from the universities, the National Institute of Higher Education or the regional technical colleges, have been taught by people who are plugged into the latest developments in software technology and hardware as well.

"There's an excitement that most people I have interviewed share. I'd rather hire someone young and inexperienced than someone who has been around a few years and wants to change jobs for financial reasons," he said.

Harrington finds Irish higher education quite different from that in the U.S. He attended the University of Kansas, studying liberal arts with a math focus. "I have a degree in math but also had Western civilization, European history and so on. They don't have that here in Ireland; they are specialized in whatever field they choose — engineering, math, physics, business. They come out with a fairly rigorous education, with exposure to the latest academic thinking in the subject, which is very good for us."

Secondary-school instruction in math, science and languages is more rigorous in Ireland than in the U.S., according to Bill Lane, who teaches in the Department of Electrical Engineering at University College Cork and heads research on integrated circuits in the National Microelectronics Research Center there. He says the Learning Cert, an exam for certificate after secondary or Second Level school, is extremely difficult on an overall basis.

"In electronics and electrical engineering, we are in a very lucky position," said Lane, who moved to Cork from Toronto 3½ years ago. "There's enormous demand by the students to enter electrical engineering. We're able to take the cream of the crop."

MIS at Wang Ireland

Pat McKenna, Wang Ireland's MIS manager, formerly worked for Amdahl Corp. and DEC and now has a staff of 11. Wang's $75 million plant at Limerick does no product R&D, but McKenna thinks that by concentrating on new business uses of existing products, his company has made at least two unique accomplishments: a record for rapid implementation of materials requirements planning (MRP) and speedy customs clearance of export shipments.

Wang opened in June 1980 in a temporary facility. "We were on-line with things like bills of materials, materials movements and materials planning by the following May. That's very unusual. There's usually a 12- to 18-month lead time in an established plant" for putting MRP into action, McKenna said.

The new 160,000-sq-ft plant has implemented the first third of an MRP system called Amaps (Advanced Manufacturing, Accounting and Production System), written by Comserv Corp. of

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Minneapolis. This integrated manufacturing system handles materials planning, production controls and financial reporting. "We were lucky that package was available with our hardware," McKenna said.

One practice he regards as unique, at least in an Irish context, is integration of data processing, word processing and electronic mail. When a traffic clerk sends off an invoice at the time a shipment is ready to go out, the invoice data is fed into the electronic mail system and sent to one or more of the 35 Wang offices throughout Europe. The equipment gets through customs faster, and the pertinent offices get clean copies of the invoice much sooner than if the company relied upon conventional mail. Wang has not yet fully implemented electronic mail to and from Australia, but transmission by telex has eased entry of shipments there.

Wang's distribution plant in Tewksbury, Mass., which developed the software, adopted the system soon after the Limerick pilot program proved the application's worth in April 1982.

Wang's Limerick facility produces nearly the entire Wang line — computers, word processors, office information systems, the large virtual storage multiple-purpose machines and peripherals — except for the firm's new micros. Wang was among the last of the top 12 U.S. electronics companies to enter Ireland. Several senior Wang managers in the U.S. had worked in Europe and noted that other U.S., European and Japanese firms had succeeded with their manufacturing in Ireland.

Wang, whose European marketing headquarters is in London, to date has no other production facilities in the EEC, but in October it announced plans to set up at Stirling Science Park in Scotland, where a 70,000-sq-ft factory is scheduled for completion in 1983.

In the current fiscal year that began July 1, Wang Ireland is expected to produce $155 million in exports from Limerick; the 1981-1982 output was $58 million. There are 350 employees now, up from 250 last year, with a rise from $35,200 in exports per worker to $44,285. Most exports go to EEC nations. Substantial shipments go to Australia. It costs no more to ship there from Ireland than from the U.S. Wang also sells to such non-EEC countries as Sweden and Switzerland.

Wang is building a second 160,000-sq-ft plant in Ireland into which it plans to move in another two years. It expects to employ 1,000 people there within five years, half on direct production tasks and the rest for support functions.

Export Earnings

Ireland does not try to sell itself as a low-wage country, according to the IDA's Coffey. It cannot compete on that score with Singapore or Korea, even though its labor costs are significantly less than in the rest of Europe. The IDA encourages firms to begin trial operations in rented space where they learn that assembly operations can be conducted competitively and then undertake more advanced manufacturing.

The Four-Phase operation in Cork does not do any manufacturing, confining its work to developing new applications software. Yet even with managers and designers traveling a good deal, the company's total costs run 10% to 15% lower in Ireland for a comparable amount of work, vice-president Peter Cook estimates. Manager David Harrington hopes that the operation's software products will earn at least as much as counterpart work at Four-Phase's Portland and Cupertino sites.

Manufacturing in an EEC country eliminates import duties of 10%. When CPT set up its Cork plant in early 1980, its total international sales, principally to EEC countries, were $17.9 million for that fiscal year. They have since risen to $42.3 million. Its sales to Western Europe in fiscal 1982 involved $15.3 million from international operations, $24.9 from domestic. Forty percent of all CPT production, and 30% of its value, is now sold internationally. The company plans to have all manufacturing for non-U.S. and non-Asian markets done in Ireland, where it is also setting up a design facility.

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by countries, but its current overseas sales total more than $1 billion — $1,006,000,000. It has two hardware manufacturing plants and one software plant in Ireland, two in the UK and one each in West Germany, the Netherlands and France. Possibly because DEC was the first U.S. computer firm to invest in Ireland, it has found the Irish government to be "one of our best customers, even though IBM and Honeywell are strongly represented by very effective sales forces," said Clonmel plant manager O'Connell.

DEC equipment is used by the national departments of Health & Welfare and Ordinance & Survey, and by the National Transportation Board to keep track of its fleet of buses and freight. Domestic sales amount to less than 5% of DEC manufacturing output in Ireland. O'Connell said he thought DEC equipment is "used exclusively for Third Level education in all the universities." DEC computers are also widely used in the technical colleges.

Corporate Communications

At DEC's Clonmel installation, "We've all got terminals in our offices," O'Connell said. "We're connected to account holders in Galway, in Reading, in Ayr, Geneva and the U.S." through leased dedicated phone lines. "I can send a message and probably get an answer within an hour from the States. That cuts down secretarial time, trying to make telephone calls, getting through to the outside operator who then can't find the guy . . . who [cannot be disturbed because he] is sitting at his terminal where my message is stored," he added.

"Within two months we're implementing Decmail, so we will have an internal mail system just for this plant, automatically linked down through networking to the International electronic mail system. Decmail will also include word processing, which involves work-integrated WP tied to International.

"Tying into the EEC X.25 Euronet Diane system will depend very much on how each national government in Europe approaches the availability of X.25," O'Connell explained. Unlike the U.S., where telecommunications is market-driven, communications systems are owned and controlled by government in every European country. That tends sometimes to slow up the introduction of technology and compatibility with existing technology, he added.

"Our local-area data networking strategy is that we will be compatible with the X.25 protocol. Whether or not that means we will be compatible with the X.25 that comes out of Lithuania in two years' time is a different question. Germany, the UK, France and the U.S., I have no doubt about.

"Part of our strategy over the next four years [here in Clonmel] is for us to be the sole European Digital plant for manufacturing the communications options necessary to configure Ethernet," O'Connell continued. "This plant will supply the entire European market for basically configuring a distributed systems network — the options that can configure any network in Europe. We intend to transfer that technology into our sales and marketing force. Our engineers here are configuring our experimental Ethernet ring to be put into this plant by early spring."

The sophistication and motivation of DEC's MIS department is as important as its engineering department in driving future innovation. The consequence for customers, in O'Connell's view, is that they should "actually use the systems that are there to understand how they link together.

"We learned a great deal about office automation in this plant when we introduced WP," he said. "Next we introduced electronic mail. Outside of MIS and Engineering, the rest of us probably multiplied our knowledge by a factor of 10. I have no computer languages myself, but I know how to receive a message and send replies. I'm not interested in Cobol or Basic but in what their applications will be five years from now."

Communications Problems

The government-owned Irish Posts & Telegraph (P&T) system is investing $800 million to lift telephone services out of a condition

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considered as bad as France's 10 years ago. In the first two years of this five-year program, half the money has been spent on buildings for new exchanges and microwave towers.

Satisfactory results have been reported in Dublin and Limerick, but frustration is rife in many other parts of the country. Four-Phase people, for example, are more often than not unable to access Motorola's direct line from Europe to the U.S. In early November, heavy rains soaked cables so that DEC Clonmel was temporarily incommunicado — but floods anywhere can cause such an impasse. The National Microelectronics Research Center at Cork has an auxiliary generator, but does not have the advantage of securely uninterrupted power supply.

So far as telephony goes, though, fully digital, automated service is "promised" in two more years. But just as in large U.S. undertakings, everything is not going exactly as planned. The new exchange building in Bandon is reportedly half as large as needed, but P&T defenders, when told that a wall must come down to permit an addition, said, "At least we got the project through planning."

And there are visible improvements in telephone service. Although residences must wait four years between applying for a telephone and getting it, businesses are said to receive prompt installation. And Pat McKenna of Wang says the Limerick plant has had no telephone problems whatsoever.

Irish phone bills are not itemized. They tell the number of message units used and their total cost. If a corporation chooses to monitor outgoing toll calls, it can.

Recessionary Impacts

Ireland has had a rougher experience during the worldwide economic recession than most countries with open societies. Inflation by late 1982 was 17%, unemployment, 14% and rising.

Some U.S. executives find it odd that the IDA recommends they enter into contracts with unions on the grounds that 75% of the manufacturing labor force is unionized. Every year or 15 months, a general agreement called the "National Understanding" sets prevailing wages and salaries in various sectors.

Silicon wafers enter furnace chamber at Analog Devices' Limerick plant.

An IDA study of foreign manufacturing operations in Ireland a few years ago reported that four out of five firms had lost no work time from strikes and nine out of 10 lost less than one day per employee because of labor difficulties. That is industrial peace for the private sector, even though public workers have had more frequent and prolonged interruptions. The 1980 postal strike, for example, lasted several months.

Ireland's per capita external debt of $2,000 rivals that of Poland and Mexico. But half its gross national product is exports that earn foreign currency. Ireland's national solvency is attested by the World Bank. The new cabinet of Prime Minister Garret Fitzgerald will surely continue to support IDA programs. The coalition may even tax farmers, whose free ride may finally end.

As in most industrial nations, Ireland's unemployment is directly influenced by high technology. The 1981 three-volume report, *Microelectronics: The Implications for Ireland*, prepared by the National Board for Science & Technology (NBST) in Dublin, financed by the Irish government and the Commission for the European Communities, showed that the use of microelectronics "will probably lead to a reduction in jobs," but the failure to exploit microelectronics would lead to "increasing uncompetitiveness" whose "secondary effects on employment could be far more serious than the direct displacement effects."

The NBST predicted rising employment in information industries: "While some administrative office jobs may become redundant, the overall information industry will increase substantially. The key issue here is productivity . Machines and systems of the 'office of the future' are expected to increase productivity dramatically." Even though some researchers argue this will mean fewer information-handling jobs, the NBST report predicted that white-collar jobs will rise from 227,000 in 1980 to 312,500 in 1990.

Because domestic markets, industrial relations difficulties and other conditions differ from one European

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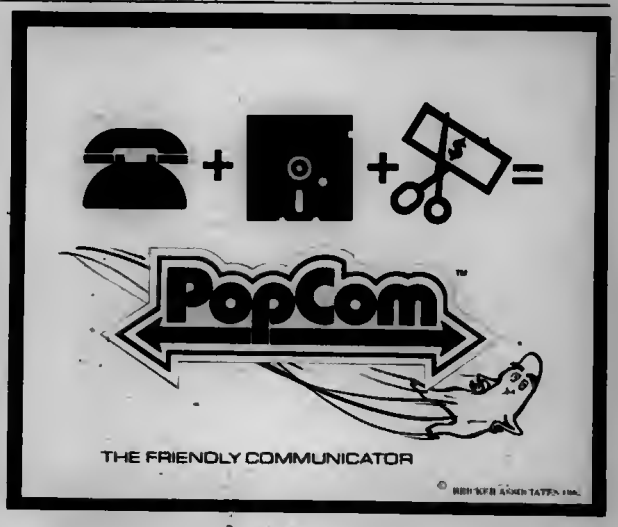

country to another, it may be prudent for U.S. firms to establish their presence in more than one EEC nation, as DEC did and Wang is now doing.

UK Competition

The UK is doing all its government thinks it can to compete with Ireland's industrial recruitment. In mid-1978, its Department of Industry announced two programs: the Microelectronics Industry Support scheme, allocated £70 million over five years, and Microprocessor Applications, given £15 million for openers. Encouragement of new software products was dispensed at £2 million per year, but £10 million additional over the next three years is in force. Among outright grants offered:

- Development and/or applications of new technology in microelectronics; software; fiber optics; opto-electronics; computer-assisted design, manufacture and testing; and robotics: up to 33½%, or in certain circumstances a preproduction order or contribution of 50% recoverable from sales.
- For R&D: up to 33½% on eligible projects up to £5 million.
- In-plant training: 40% of essential costs plus 40% matched from the European Social Fund.
- In "special development areas" near Cardiff, Glasgow, Liverpool, Newcastle upon Tyne and South Cornwall, 22% on new buildings, machinery and plant. In other "development" areas, these capital expenses are reimbursed 15%.
- For each new job in office and service industries, including R&D, up to £8,000 in special development areas and up to £5,000 in development areas.

Conspicuously absent from having a big Irish manufacturing plant is IBM, which has 300 sales and service people in Ireland. IBM's large presence in Britain is believed to total nearly 15,000 employees.

University Research

The outside of the tall gray stone Maltings building on the river Lee recalls dark, satanic mills from the early industrial revolution. The National Microelectronics Research Center of University College Cork moved into its renovated interior in mid-November. Its director, Prof. Gerard T. Wrixon, is a native of Cork who spent a dozen years in the U.S. porsuing doctoral studies at MIT and research work at Bell Laboratories.

Working with him are 15 professional and technical staff and 12 postgraduate students. As the center expands, their numbers are expected to increase 50%. Aside from £3 million in equipment and £1 million used to yield 1,300 square meters of laboratory work space on four stories, in 1982 35% of its £300,000 annual budget came from applications R&D in collaboration with industry.

Analog Devices, Inc. is funding a project on laser recrystallized silicon resistors. About 320 square meters of clean space for silicon fabrication have facilities for ion implantation, photo mask design by electron beam lithography, diffusion, oxidation and metallization. Currently under development is a polysilicon gate integrated circuit (IC) manufacturing process. This process is expected to be running by the end of 1983.

The U.S. Army, the Science Research Council of Great Britain, its counterpart in France and the Max Planck Gesellschaft in the Federal Republic of Germany sponsor R&D work in the center's gallium arsenide facility that produces circuits capable of work at much higher speeds than silicon ICs. For six years up to 1980, University College Cork's Department of Electrical Engineering, which Wrixon chairs, had made gallium arsenide devices that were chiefly low-noise, high-frequency Schottky diodes and metallic-oxide-semiconductor field-effect transistors (Mosfets).

New techniques led to design and fabrication of a 27-device digital circuit in early 1982. The center's electron microscope is used for submicron direct wafer lithography for making Mosfets with gate widths of less than one micron. In collaboration with the Electrical Engineering Department of the University of California at Berkeley, the Cork NMRC is developing a monolithic 90-GHz low-noise front-end and IF amplifi-

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STRATUS VS. TANDEM

(Or how the hardware fault tolerant solution supersedes the software based solution.)

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You can build a double computer inside one box for less dollars, as opposed to doing it in software, which continually needs maintenance and revision, as well as improvement."

by Aaron Goldberg
of IDC which
appeared in *Computerworld's*
December 28, 1981 issue

STRATUS/32 – SYSTEM HIGHLIGHTS

1. A simple hardware solution to fault tolerance that totally eliminates the need for extra application design and additional programming.
2. A design without performance penalties for fault tolerant operation – NO CHECKPOINTING!
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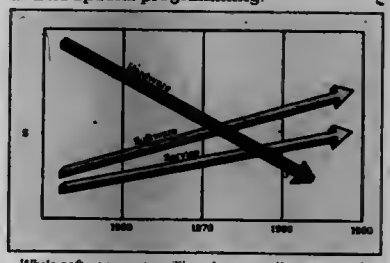
Why more hardware is better than more software.

The crux of the problem with software based systems is that they require complex, performance stealing software to provide fault tolerant operation. This software robs the system of precious resources because it uses processing cycles to pass status and checkpoint information back and forth between two computers. What's more, this passing of information can occur at four levels: operating system, user-program, file management, and terminal control.

Stratus, meanwhile, has eliminated all this reliability software by having duplicate hardware components tightly coupled, dedicated to performing the same tasks at the same time. It's like having two computers in one, rather than two separate computers. Checking hardware logic detects errors with no performance loss and stops failing components instantly. The duplicate partner continues without interruption, unaffected by the failure. This is all transparent to the programmer and the user. With Stratus, there is no performance or data loss when there is a failure, no operator intervention, and no special programming.



While software costs will rise because they are people dependent, experts agree that hardware costs will continue to fall

Why Stratus is easier to implement.

The Stratus designer and programmer might as well be dealing with a conventional computer; one of them, not two.

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The center is collaborating with Cornell University investigators to develop a finite element model for a gallium arsenide Mosfet. It has also obtained recent funding for two- and three-dimensional simulation programs for MOS devices.

While the IDA uses the NMRC as a place to take visitors, it does not give it money. Center funds come directly from the central Irish government. Its investment is toward the day when grants and tax concessions may pale beside the magnetism of scientifically educated people.

Bargain Work Space

Critics could say that the IDA's sense of urgency may have led it to overbuild. Yet the many brand-new empty industrial plants in Ireland may offer an historic opportunity for multinational corporations.

Companies can start modestly, then deepen their presence. Verbatim Corp. had until recently used its Irish plant wholly to stamp out disks, but has recently begun a software R&D division.

"We have millions of square feet to offer," said Dan Coffey, "at knock-down prices. Corporations may want to rent for a year or two while they build their own facilities. They can perform some kind of assembly and test operation to prove to themselves that what we say about Ireland as a location is true.

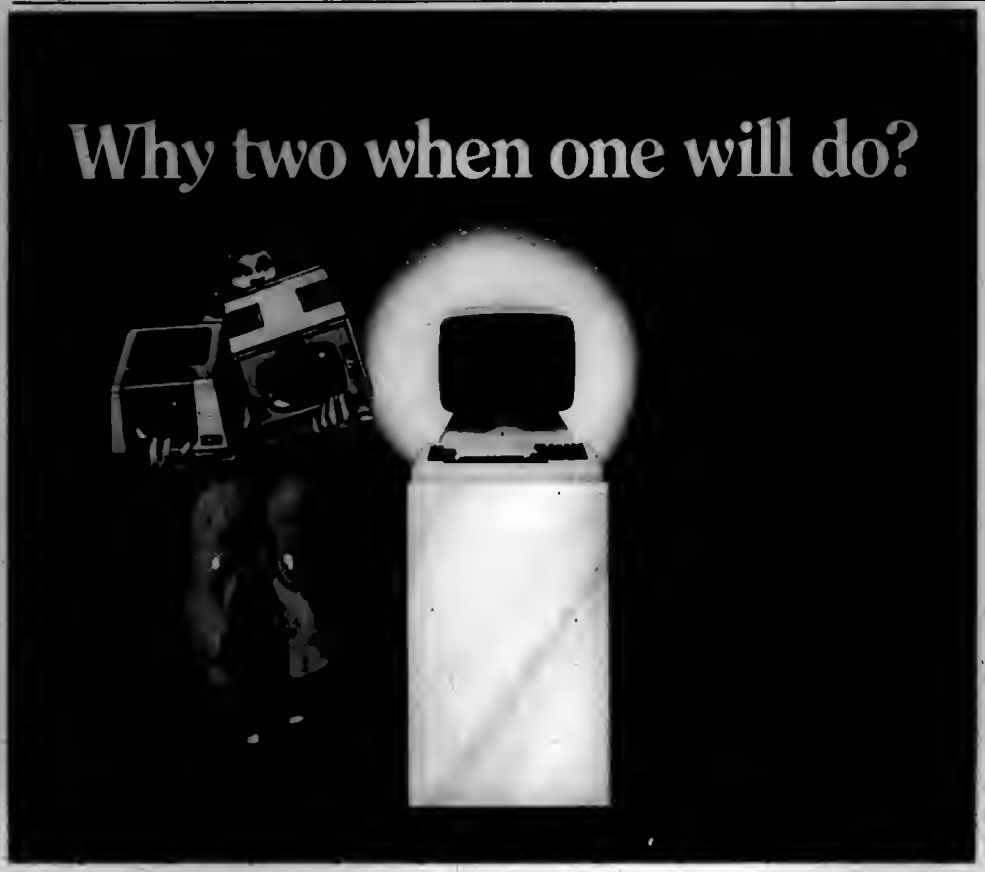
"Six to nine months in, they may decide to deepen their operation so that it won't be merely assembly-and-test. They can start looking around at their leisure for something else. If they need more than 30,000 or 40,000 square feet, they can move into twice that space while their own facility is under construction. We, the IDA, can serve as general contractors," Coffey added.

Perhaps the most convincing part of IDA's story is that its program has proved satisfactory to high-tech companies and to Ireland, time and again. Electronics exports now amount to $600 million annually, with the potential for much growth ahead.

About the Authors

Henry and Elizabeth Urrows are a writing team based in Ridgefield, Conn. They are currently completing a book on videotex called Punch Up the World *for Reston Publishing Co.*

The Urrows write principally on science for general readers. Their work includes articles for Infoworld, Microcomputing, Creative Computing *and* Personal Computing.



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The Series 400 System also provides you support for up to 32 devices, including Lee Data's unique All-In-One display that offers dynamic selection of 4 screen sizes—three 80-column and one 132-column. Lee Data's 3279-compatible color displays and a full line of printers are also available as part of the 32-device complement.

3270 and VT100 capabilities combined in a single terminal system—a reality with the new 3270-plus-Async system from Lee Data.

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Sage Unveils 16-Bit Supermicro

RENO, Nev. — Sage Computer Technology has announced the availability of the Sage IV 16-bit supermicro, said to accommodate up to six users and to surpass the capabilities of the Sage II machine introduced last March.

Both machines are based on the Motorola, Inc. 8-MHz 68000 processor and are reportedly capable of performing two million instructions per second. The performance is said to be comparable to that of high-end minicomputers at a mid-range to high-end business micro price.

Sage's P-System operating system runs on the Sage IV, which comes with 128K bytes of main memory — optionally expandable to 1M byte — a floppy or removable 5M- to 30M-byte Winchester disk and a 5¼-in. floppy backup. The cabinet measures 6½-in. high by 12½-in. wide by 16¾-in. deep. Because there are no wait states, a 20K program can load from the floppy in one second and from the hard disk in one-tenth of a second, the vendor said.

The Sage IV ranges in price from $6,800 to $8,600, depending on configuration, a spokesman said. Sage is located at Suite E, 35 N. Edison Way, Reno, Nev. 89502.

Operates With 'Keyplus'
Harris DDP System Out

FORT LAUDERDALE, Fla. — Harris Corp. has introduced an entry-level distributed data processing (DDP) system that reportedly provides basic DDP functions such as remote job entry and data entry.

The Harris 1640 system supports up to seven CRT stations and has numerous migration options for adding other functions as they are needed through field upgrades.

In addition, the 1640 system operates with Harris' Keyplus software, a set of data entry application programs and a library of utilities, a spokesman said.

A Model 1640 unit configured with 16M bytes of fixed and/or removable disk memory, data entry software, five displays with detached keyboards, a 300 line/min chain printer, a single remote job entry emulator and key entry processing applications with associated utilities can be purchased at $1,563, according to the spokesman.

More information is available through Harris Corp., located at 2101 W. Cypress Creek Road, P.O. Box 6200, Fort Lauderdale, Fla. 33310.

Plessey Announces Addition To Its DEC-Based Series 6000

IRVINE, Calif. — The Computer Systems Division of Plessey Peripheral Systems has announced an addition to its Digital Equipment Corp. minicomputer-based Series 6000.

The System 6000/230 is said to offer increased main memory, an 8-in. 80M-byte Winchester disk drive and built-in magnetic tape or floppy backup features not available from DEC.

Aimed at DEC users who require additional mass storage capacities in a multiuser environment, the system reportedly incorporates 256K bytes of main memory and either single or dual 8-in. floppy disk drives with 1M-byte capacity each or a ¼-in. streaming tape drive with 20M-byte capacity.

Compatible operating systems include Human Computing Resources Corp.'s Unity; Intersystems, Inc.'s ISM-11; and DEC's RT-11, RT-11/TSX, RSX-11M and RSTS/E. The system costs less than $25,000 from the vendor at 17466 Daimler, Irvine, Calif. 92714.

Prime Debuts CAD Workstations

NATICK, Mass. — Prime Computer, Inc. has introduced a family of intelligent workstations intended to improve productivity in computer-aided mechanical design environments.

The PW200 is a 32-bit virtual memory stand-alone workstation that reportedly performs solids modeling. The product incorporates dedicated modules of the company's Medusa software, an integrated mechanical computer-aided design (CAD) system. Medusa offers two-dimensional design and drafting and three-dimensional solids modeling capabilities.

The product's graphics capabilities and Prime's CAD software provide a complete productivity tool in a mechanical design workstation, the vendor said. With PrimeNet, the company's networking software, the user can link the PW200 with any of Prime's 50 series of 32-bit microcomputers, creating a design network to meet his needs. Meanwhile, each user retains his own interactive Medusa design environment, with the capability to share programs, information and resources stored or managed by the Prime host system.

Hardware for the PW200 consists of a graphics unit with a high-resolution color raster display monitor, a data-entry tablet, an alphanumeric keyboard and a joystick for each manipulation and control of the screen cursor. The processor features 1M byte of main memory, one sealed 68M-byte Winchester disk and a 15M-byte cartridge tape drive for storage, backup and transport of data, the vendor said.

The processor drives a microprocessor-based display controller over a high-speed direct memory access interface. The display controller can support six serial ports, according to the vendor.

Available in four basic configurations, the PW200 Series ranges in price from $61,000 to $95,000. The machines are slated for shipment in the third quarter of 1983.

Prime is headquartered in Prime Park, Natick, Mass. 01760.

Giving Micros The Business

Is a microcomputer helping you run your business?

Computerworld is preparing a Special Report on "Micros in Big Business" for its March 28 issue. If your business incorporates microcomputers in a way that significantly impacts overall data processing operations, CW would like to hear from you.

We are particularly interested in microcomputers that are directly attached to a large host processor, microcomputers linked through a communications network to a host processor and micros linked together. We are also interested in ways that micros are being used to replace larger processors or to offload some of a mainframe's work load.

If your shop is doing any of these things, we would like to hear about it. Write a description of the application and send it by Feb. 1 to Tom Henkel, Writer/Analyst, *Computerworld*, 375 Cochituate Road, Box 880, Framingham, Mass. 01701. Articles must be typewritten, double-spaced and no more than five or six pages in length. Accompanying graphs, charts and pictures are welcome.

Articles about stand-alone applications or those involving nonbusiness applications, such as computer games, will not be considered.

C. Itoh Announces Two Line Printers

LOS ANGELES — C. Itoh Electronics, Inc. has unveiled two desktop variable-speed dot matrix line printers.

The CI-300 and CI-600 line printers feature a variable speed shuttle mechanism and a 400 dot/in. resolution, according to the vendor. The CI-300 printer reportedly performs at speeds ranging from 80 line/min for letter quality and up to 300 line/min for data processing applications.

The CI-600 printer reportedly doubles the CI-300's printing speed range. Both machines also handle graphics, labels, bar codes, forms generations and diagrams, the vendor said.

The CI-300 is currently available for $4,500. The CI-600 is slated for shipment in the second quarter of this year and is priced at $5,700. More information is available from the vendor at 5301 Beethoven St., Los Angeles, Calif. 90066.

Digitex Introduces 7000, 8000 Micros

LOS ANGELES — Digitex has introduced the 7000 and 8000 series microcomputers, which reportedly provide business and professional users with multiuser systems capable of operating Digital Research, Inc.'s CP/M, Phase One Systems, Inc.'s Oasis and Dataplus on the same Winchester drive. Dataplus is the Digitex compiler and interpreter that allows programs originally written on Datapoint Corp. computers under the Databus language to operate in the Digitex environment under the Oasis operating system.

These systems are equipped with 8-in. fixed Winchester, removable Winchester or diskette storage and a 6-MHz Zilog, Inc. Z80B processor, the vendor said. Digitex features single-board architecture on the S-100 bus with the CPU, floppy disk controller, 128K-byte random-access memory and up to four serial I/O ports. It also includes two Centronics, Inc. parallel ports — all resident on the same board. This allows up to five slots available for expansion on an eight-slot S-100 motherboard, according to the vendor.

Prices for the Digitex system start at $5,995 for a 10M-byte system with a 128K-byte CPU, a spokesman said from 2044 Armacost Ave., Los Angeles, Calif. 90025.

HP Adds On-Site Service to Repair Options

PALO ALTO, Calif. — Hewlett-Packard Co. has added an on-site volume repair service to its existing on-site and depot repair options. The service is available to customers who own a minimum of 25 HP workstation products.

The Volume On-Site Repair Center Service (VRC) reportedly offers the low price of return-to-factory programs while eliminating the need to package and ship malfunctioning products back to HP, a spokeswoman said. Weekly scheduled service and some maintenance is provided on equipment covered under the agreement that is gathered for repair at one site.

Most personal computers, terminals, flexible disk drives, printers and plotters are eligible for the VRC program, and individual units count toward the required 25-product minimum, the spokeswoman said.

The annual cost for the Volume On-Site Repair Center service is said to be approximately 3% to 5% of the hardware purchase price, compared with HP's 6% to 10% for next-day, on-site service on a single unit. More information can be obtained from the Hewlett-Packard Co. sales office, located at 3000 Hanover St., Palo Alto, Calif 94304.

Auto Dealers Get VIM/NET 3000

DAYTON, Ohio — Reynolds and Reynolds Co. has unveiled the VIM/NET 3000, the latest addition to its family of VIM/NET in-house computers targeted for automotive dealerships.

The microcomputer was designed for use by smaller dealer operations that previously could not afford a sophisticated in-house system, according to a vendor spokeswoman.

The VIM/NET 3000 reportedly contains expandable hardware and software capabilities. Its modular design is, said to permit the growth of processing power, peripheral expansion and data storage capacity.

With 256K bytes of memory, the VIM/NET 3000 is available in two models — 10M- or 20M-byte units — has the ability for a single unit to drive up to seven separate terminals and uses 5¼-in. Winchester disk technology. It is said to be expandable into a larger system by connecting two or more units into a network to form a single, more powerful system.

Prices for the VIM/NET 3010 and 3020 units start at $16,800 and $19,000, respectively. More information is available from Reynolds and Reynolds Co. at 8000 Germantown St., Dayton, Ohio 45401.

Fourth Annual Conference on
EDP PERFORMANCE MANAGEMENT
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Feb 28-Mar 4, 1983

The annual Conference on EDP Performance Management explores the major management issues involved in data center performance improvement. It is the only conference devoted solely to management concerns, and the integration of performance related activities into existing DP management approaches.

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THE INSTITUTE FOR CERTIFICATION OF COMPUTER PROFESSIONALS ANNOUNCES THE
CDP ANNUAL EXAMINATION
SCHEDULED FOR MAY 7, 1983

The Annual examination for the Certificate in Data Processing (CDP) will be held on May 7, 1983, at selected test centers throughout the world.

Specific requirements for this year's examination are detailed in the "Certificate in Data Processing Examination Announcement and Study Guide." The study guide and application form for the 1983 examination are available on request from ICCP.

Deadline for Filing Applications: March 1, 1983

Please forward the "Certificate in Data Processing Examination Announcement and Study Guide" along with application and test site list.

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Multifunction Printers Out

SANTA ANA, Calif. — Infoscribe, Inc. has announced three multifunction printers that incorporate a sound-reducing structural foam printer chassis.

The Model 1100 can be used in either a draft or data mode while operating at 200 char./sec. The unit operates in a correspondence mode at 100 char./sec, and in a business letter mode the unit operates at 40 char./sec. The printer can produce dot-addressable graphics and costs $2,995, the vendor said.

The Model 1200 uses a four-color ribbon to produce up to eight colors. The unit is available with the same printing speeds as the Model 1100 and costs $2,495, the vendor said.

The Model 1500 is available for high-speed applications printing at 400 char./sec. The unit operates at 200 char./sec in a correspondence mode and, like the Model 1100 and 1200, offers graphics capabilities, the vendor said from 2720 S. Croddy Way, Santa Ana, Calif. 92704.

Data Node Offers RS-232 System

SAN JOSE, Calif. — Data Node, Inc. has announced the addition of the DN81 single-drive RS-232 CPU system to its product line.

Connecting the DN81 to a dumb terminal configured to a host allows the user to have a personal desktop computer, according to the vendor. It can reportedly communicate with any CRT terminal that uses RS-232.

This system reportedly offers a single 8-in. drive with 500K bytes of storage capacity, a Zilog, Inc. Z80A processor, 64K bytes of random-access memory, 4K bytes of read-only memory, Digital Research, Inc. CP/M operating system and Data Node's operating software.

This product is priced at $1995, the vendor said from Suite 103, 1440 Koll Circle, San Jose, Calif. 95112.

Printer Offered For Data Logging

ADDISON, Texas — Telpar, Inc. has announced the PL20RM, a 20-col., panel-mount thermal printer for data logging and other general-purpose, hard-copy applications.

The unit is available with 96 Ascii characters and comes with switch-selectable parallel or serial interfaces. The thermal printer can operate with either an ac or 12-volt dc current, the vendor said.

The PL20RM costs $575 through P.O. Box 796, Addison, Texas 75001.

Alloy Unveils Tape Controller

NATICK, Mass. — Alloy Computer Products has introduced an LSI-50 Streaming Cartridge Tape Controller that provides an interface to make the Control Data Corp. Sentinel streaming cartridge tape drive compatible with the Digital Equipment Corp. LSI-11 processor.

Each 450-ft streamer cartridge can reportedly store 48M bytes, unlike the 4.5M bytes typcially available at 512-byte record lengths with conventional start-stop tape systems, according to the vendor.

Functionally emulating the DEC TU-10/TM-11 tape system, Alloy's controller provides backup plus serves as a means of program load, the vendor explained. The streamer is reportedly error-transparent and writes bi-directionally to 11 tracks, so the operating system problems previously associated with soft errors and rewind timeouts between tracks are eliminated.

The single, quad-size product is priced at $1,195, the vendor said from 12 Mercer Road, Natick, Mass. 01760.

Boosts PDP, VAX Capacity

Unibus Repeater Introduced

HUNTINGTON BEACH, Calif. — Ranyan Computer Enhancement Systems, Inc. has unveiled a Unibus repeater said to permit users of Digital Equipment Corp. PDP-11 and VAX-11 computers effectively to double their system capacity by providing an external interface to the CPU backplane.

The BMA-1U Unibus repeater reportedly provides a physical and electrical extension of any Unibus so that up to 19 extra bus loads may be interfaced, using a bus extension of up to 50 feet from the CPU. The product consists of a single dual-width printed-circuit board that is installed in the connector paddle slots normally used for the Unibus cable or interconnect mode.

It is totally software compatible so that no new software is required, the vendor said.

Attachment of virtually any device to a PDP-11 or VAX-11 Unibus reportedly is permitted, including additional main memory, terminals and printers.

The only penalty reportedly incurred in the use of the repeater is a slight 80-nsec increase in access time when interaction occurs between devices on different sides of the BMA-1U. The BMA-1U Unibus repeater costs $1,480 from Ranyan Computer Enhancement Systems, 15239 Springdale St., Huntington Beach, Calif 92649.

THE BEST HAS JUST BECOME THE BEST DEAL.

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*Digital pen sold separately

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5 Reasons to Move Up With CCI's POWER™ 5

1 **PerpetualProcessing™ Reliability** – Computer Consoles' Power5™ family of systems can withstand multiple failures because each subsystem operates independently with its own copy of the operating system. This contrasts with other "fail-safe" systems which depend upon synchronized pairs or multiple processors around a single shared memory. Designed with high volume transaction processing in mind, CCI's fault tolerant architecture has been a staple of critical telephone industry applications since 1973.

2 **A Highly Flexible Operating System** – PERPOS™, CCI's proprietary operating system, is designed to support high volume, high availability transaction-oriented environments. PERPOS, fully compatible with UNIX*, is easy to use, and supports program development. It also supports a full complement of languages, such as FORTRAN, COBOL, BASIC and "C" as well as data base management.

3 **Complete Networking Facilities** – CCI's Data Highway™ can be used as the interconnect vehicle for many types of local communications. It also functions as the vehicle to link independent subsystems in PerpetualProcessing. A Distributed Communications Applications Processor (DCAP) can be used, in conjunction with standard carrier facilities, to provide remote communications with other CCI or other vendors' systems.

4 **A Fully Compatible and Expandable Family of Systems** – Because CCI's operating system is used throughout the Power5 family, you can start with the Power5/20™, a self-contained single processor system. This can later be integrated into a multiprocessor system with thousands of terminals, configured to your requirements without unnecessary duplication of hardware.

5 **Established Support** – Computer Consoles has a fully trained Field Service force at over 75 sites throughout the United States and Canada. Installation and maintenance of every CCI system is coordinated by a network of system software and hardware support specialists.

The Power5 family, combined with OFFICEPOWER™, CCI's integrated office automation system, provides full office and data processing functionality.

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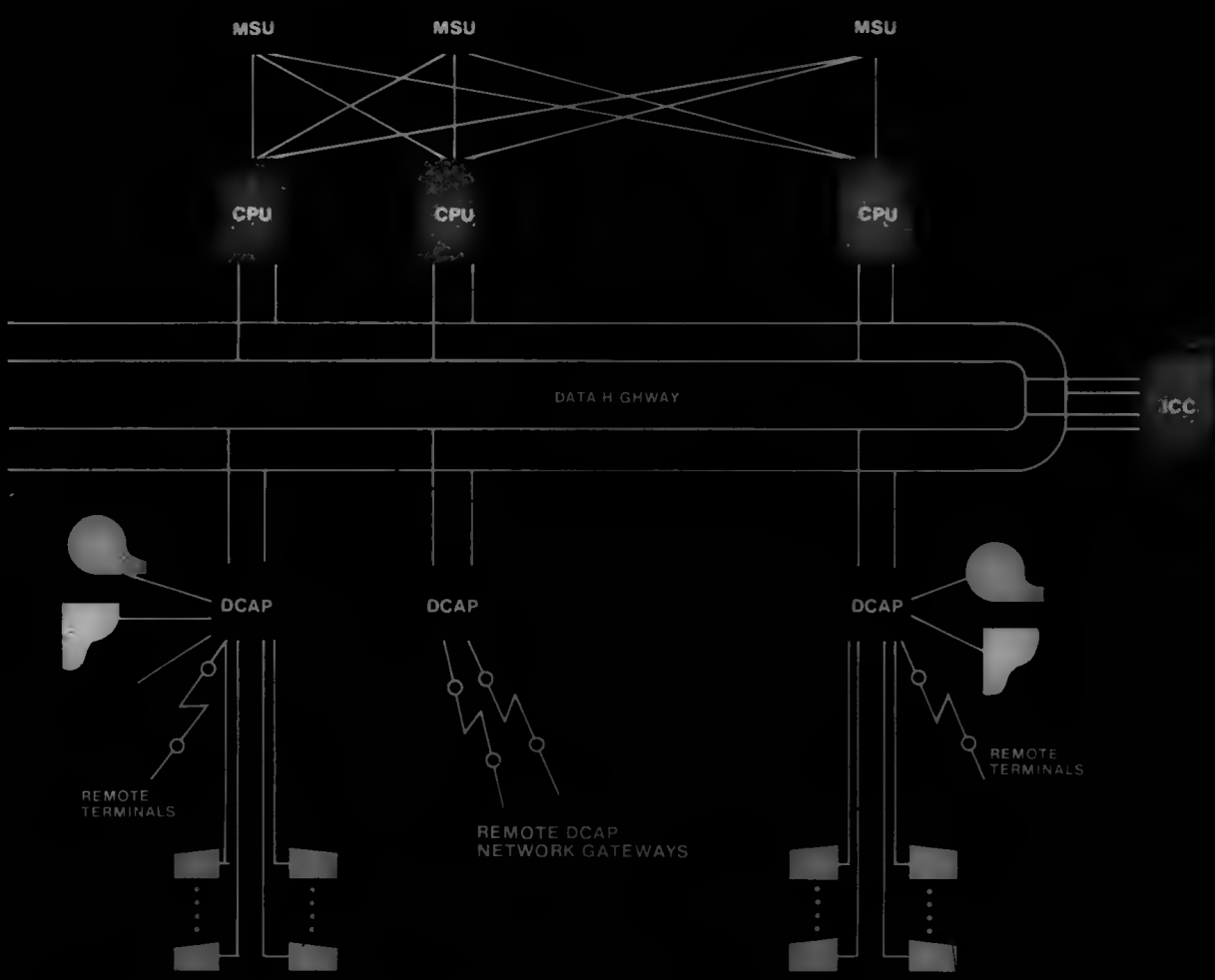

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DISTRIBUTED COMMUNICATIONS AND APPLICATIONS PROCESSOR (DCAP

MAGNETIC TAPE UNIT (MTU

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Graphics Package Out

DENVER, Colo. — Auto-Trol Technology Corp. has announced the release of its Advantage Series 5000 32-bit computer-aided design (CAD) software for architecture, engineering and construction applications.

The software runs on Auto-Trol's Advanced Graphics Workstation and Digital Equipment Corp.'s VAX series of computers. It enables users to tailor their CAD system to their company's own special requirements and allows Auto-Trol users to migrate their 16-bit CAD system investment to the new 32-bit-based technology.

The software is available on a stand-alone 32-bit graphics system called Advanced Graphic System and starts at $90,000 per work system for the complete system from the vendor at 12500 N. Washington St., P.O. Box 33815, Denver, Colo. 80233.

Uses 3740/System/34 Format

Disk Controller Out for Apple II

SAN DIEGO, Calif. — Sorrentino Valley Associates (SVA) has announced a universal flexible disk controller designed for Apple Computer, Inc. Apple II and III computers.

Megaflex is said to be fully compatible with Apple SOS, Dos 3.3, Pascal and Digital Research, Inc.'s CP/M. Because all diskettes utilize the IBM 3740/System/34-type format, diskettes are transportable from the Apple to other systems such as those from Altos Computer Systems, Inc. and Radio Shack and IBM's Personal Computer, the vendor said.

Features include "tri-mode" operation, which allows users to connect with 8-, 5¼- and 3-in. drives; a universal interface that plugs directly into an Apple II or III; and "soft drivers" that reportedly allow operation with a wide range of disk drives without read-only memory or hardware changes. Users are allowed up to four drives per controller for a maximum of 4M bytes of on-line storage.

Megaflex retails for $299 from SVA, 11722 Sorrento Valley Road, San Diego, Calif. 92121

Now you can add 31 IBM 3270 devices without adding 29 miles of cable.

Our new CMX Cable Multiplexer takes up to 32 inputs from an IBM 3274 Controller, combines them into a single signal, in a single cable, for demultiplexing up to 1500 meters away. With ou perfnrmance degradation. So using an existing cable, you could add as many as 31 new terminals without pulling any new cable at all: at 1500 meters each, that's 29 miles of cable you don't need to find room for, install or manage.

Installation is easy, using existing RG-62A/U coaxial cable and BNC connectors. It's especially easy when you consider the alternative—pulling miles of new cable through already-crowded ducts.

Up to four cables can be run from the CMX, so you can support 3278, 3279 and 3287 devices on different floors, or in different directions, from one unit.

The CMX Cable Multiplexer system is available in 32-port, 24-port, 16-port and 8-port models. It is completely transparent to IBM user software and terminal operation and meets all type A interface and cabling specifications.

Another solution to your local communicatinn problems from Ungermann-Bass, the Net/One™ company.

Please call the regional office nearest you for more informatioo about the new CMX system: Santa Clara, CA, (408) 496-6464; Burlington, MA, (617) 273-5858; St. Louis, MO, (314) 434-1024; Dallas, TX, (214) 385-7090; Los Angeles, CA, (714) 553-1771.

Ungermann-Bass

Powerpod Announced

EL MONTE, Calif. — Atlas Energy Systems has announced the MPC Powerpod, a combination rotary power conditioner and power distribution system.

The unit contains a synchronous motor that reportedly maintains a constant frequency to within ±1%, despite changes in load. The unit can absorb prolonged voltage sags and surges up to ±40% with 250 msec or more of power continuity ride through in the event of a total power failure, the vendor said.

The units are available in 10 KVA to 75 KVA capacities and cost between $17,000 and $26,000, the vendor said from 9457 Rush St., S. El Monte, Calif. 91733.

Power Series Introduced

LITTLETON, Mass. — Isoreg Corp. has introduced a series of computer power distribution systems called Guardsman, Isoshield and Isoreg.

The systems reportedly feature a high-visibility power monitor panel, transformer design, front access wiring cabinet, independent outlet and circuit breaker panels and mobility.

The Guardsman is intended for places where voltages are known to be clean and stable. Isoshield reportedly combines the isolation transformer characteristics with a Faraday shield to isolate and protect computers from continuous voltage spikes and electrical noise that can cause problems. It also reportedly features the vendor's Pentacore isolation transformer for load balance. Isoreg protects against voltage sags, surges, spikes, electrical nnise; brown-outs and power outages lasting less than one cycle, the vendor said.

Prices for these products range from $14,000 to $70,000. Isoreg Corp. is located at 410 Great Road, Littleton, Mass. 01460.

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A career can take you anywhere these days. Fortunately, there's a computer small enough to go along, yet big enough to solve the toughest problems on the way. It's Attache™ from Otrona.

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Whether you're a first-time user or an experienced, system-level programmer, you'll appreciate Attache's blend of simplicity and power. It comes complete with graphics, data communications and word processing. It gives you powerful programming tools for developing your own software. And it gives you CP/M® for access to literally thousands of pre-written programs.

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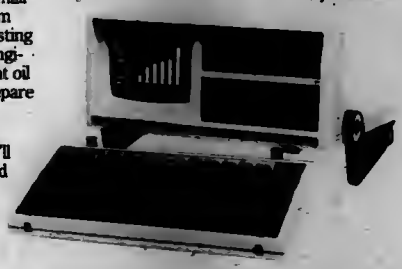

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Attache is a Trademark of Otrona Corp. CP/M is a registered trademark of Digital Research, Inc.

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Remote Storage Unit Bows

ALLAMUCHY, N.J. — HDE, Inc. has announced the Hudson Data Logging System (DLS 400), a remote data storage unit.

The DLS 400 can be used for logging point-of-sale transactions to a host processor. It can also be used for order entry with or without stock verifications. Other applications include refrigeration and heating controllers with temperature and humidity recording, telemetering and monitoring laboratory results, according to the vendor.

Features include an eight-slot internal card cage and motherboard with gold-edge connectors, up to 330K bytes of disk storage and up to 64K bytes of random-access memory or erasable programmable read-only memory, the vendor said.

The DLS 400 costs $2,395, the vendor said through Box O, Allamuchy, N.J. 07820.

CNI C-Net Interface Board Out

MOUNTAIN VIEW, Calif. — Cromemco, Inc. has introduced a single interface board that reportedly allows its users to link their standalone computer systems together into a distributed local-area network.

The CNI C-Net interface board connects the network medium — the physical data channel interconnecting network stations — with Cromemco's I/O Processor (IOP), a 4-MHz Z80A-based single-board computer with program store for downloading of the network station software.

The CNI board includes four programmable counter and timer circuits and an IOP to RS-232 interface, as well as an RS-232 serial input for use with a local terminal. This means that a complete, low-cost C-Net station can be built using no more than a power supply, a CNI board, an IOP board, a CRT terminal or any other RS-232-compatible peripheral, the vendor claimed.

Priced at $395, CNI C-Net is available from Cromemco, Inc. at 280 Bernardo Ave., Mountain View, Calif. 94043.

M20 Runs On CP/M 86, MS/DOS

TARRYTOWN, N.Y. — Docutel Olivetti Corp. has announced that its M20 microcomputer can operate with Digital Research, Inc.'s CP/M 86 and Microsoft, Inc.'s MS/DOS 16-bit operating systems, as well as the system's native operating system, Pcos.

The capability to run the two operating systems is reportedly made possible by a co-processor board, the APB 1086, which can be inserted into one of the processor's expansion slots. The board contains an Intel Corp. 8086 microprocessor with a 16-bit bus, the vendor said.

By adding CP/M 86 and MS/DOS, users can take advantage of a variety of 16-bit software programs. In addition, by adding a software emulator, users can also take advantage of 8-bit CP/M programs, the vendor said.

The APB 1086 costs $515. Additional operating systems must be purchased from their respective vendors. Docutel Olivetti is located at 155 White Plains Road, Tarrytown, N.Y. 10591.

Winnie Unit Out for S-100

GARDEN GROVE, Calif. — Advanced Digital Corp. has announced a 5¼-in. Winchester disk subsystem for users of S-100-based microcomputers.

The subsystem is built around the firm's HDC-1001 controller and is available in 5M-, 10M-, 20M- and 40M-byte configurations, according to the vendor.

The subsystem comes with a controller board, connector cable and a varying number of disk drives depending on the capacity.

A 5M-byte configuration costs $1,800. A 20M-byte configuration is available for $2000, the vendor reported.

More information is available from Advanced Digital Corp., located at 12700 B Knott Ave., Garden Grove, Calif. 92641.

NSI System Targets Hotels

PHOENIX — A microcomputer-based hotel management system that can accommodate up to four terminals has been introduced by New Systems, Inc. (NSI).

Simcom One/25A is said to feature reservation management with advance registration through 1999; rooms management with automatic room assignment and housekeeping status; guest accounting with automatic night audit; and various revenue, statistical and management reports.

System hardware can be expanded to five Zilog, Inc. Z80A processors with 320K bytes of memory to accommodate up to four terminals and seven printers. New Systems, Inc.'s computer is said to come standard with 6M bytes of Winchester hard disk storage (expandable to 19M bytes) as well as floppy disk storage for program loading and backup.

The system is priced under $10,000 and is compatible with Digital Research, Inc.'s CP/M. Simcom One/25A is priced at $9,995 from New Systems, Inc., located at Suite 9, 2505 E. Thomas Road, Phoenix, Ariz. 85016.

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Card Packages Introduced For IBM Personal Computer

BURLINGTON, Mass. — Several products compatible with the IBM Personal Computer have been introduced by IDE Associates.

The XPR series of multifunction combination cards is available with up to 256K bytes of memory, plus any or all of the following functions on a single printed-circuit board: parallel port, serial RS-232C port and clock/calendar/battery. Prices for the XPR combination cards range from $350 to $650 for one option plus 64K bytes to 256K bytes of memory. The second option is priced at an additional $45 and the third option at $30.

The MPR-512 memory card contains 512K bytes of memory on a single printed-circuit board, occupying only one expansion slot in the IBM Personal Computer. Included with the MPR-512 is disk emulation software, giving the option of using up to 320K bytes of memory as ultrafast in-memory disk, the vendor said. The price for the MPR-512 card is $915.

The MPR series of expansion memory cards for the IBM Personal Computer is available with 64K to 256K bytes of on-board memory in 64K-byte increments. It has full parity checking and generation, the vendor said. Prices for the MPR memory cards range from $275 to $575 with 64K to 256K bytes of on-board memory, respectively.

Additional information is available from the vendor at 44 Mall Road, Burlington, Mass. 01803.

Interface Cards Out for Apple II

SAN DIEGO — Microtek, Inc. has announced two video interface cards for Apple Computer, Inc. and Franklin Computer Corp. computers.

The Magnum-80 is an 80-col. card said to be Videx Corp.-compatible and available with an alternate character set built in. Said to eliminate "snow" on the monitor, Magnum-80 also has a 40/80 col. soft switch to permit autostart switching between the two modes.

The Rainbow-256 reportedly turns the Apple II or Apple II+ into a 256-color red, green, blue (RGB) driver for analog RGB monitors vs. the conventional 16-color composite video output.

Prices are approximately $259 for each card. Microtek is located at 9514 Chesapeake Drive, San Diego, Calif 92123.

Code Readers Announced

ELBRIDGE, N.Y. — Skan-A-Matic Corp. has unveiled the D4 series of modular bar code readers, said to process coded data from a remote optical sensor for display and transmission to a host computer.

Coded data reportedly can be accepted from a variety of optical sensors including hand-held code pens and fixed and moving beam scanners. Software is available for most popular bar codes. Ascii data can be entered through a terminal keyboard or key pad, and messages are transmitted in Ascii format via RS-232, 20mA current loop and 99-reader party line formats, a vendor spokesman said.

The D4's enclosure holds a mother-board with power supplies and a bus system with six plug-in circuit cards. Features include 20-char. fluorescent display, ¾A circuit breaker and switching power supply, according to the vendor spokesman.

The D4 series bar-code readers cost $1,990 each from the vendor at Rt. 5 W., Elbridge, N.Y. 13060.

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USPS, Justice Tag Raytext Cumbersome

By Bruce Hoard
CW Staff

Two government agencies using Raytext, a turnkey shared-resource word processing system available from Raytheon Data Systems Co., have complained that it is slow and cumbersome.

In addition, one of the users maintained that the Raytext software lost data without warning and overwrote index pages, rendering them useless.

The Raytext system is based on Raytheon's PTS 1200 minicomputer and VT 1303 word processors from Lexitron Corp., which is owned by Raytheon. Both users, the U.S. Postal Service (USPS) and the U.S. Justice Department, found no fault with the hardware.

A spokesman for Raytheon said less thao 20 of the systems, introduced in March 1980, are in existence. He added that the system is still commercially available and that all of the bugs have been worked out.

However, although he was asked, he did not supply *Computerworld* with the names of any satisfied Raytext users.

The USPS and the Justice Department said they experienced problems during May, 1981, more than a year after the system's introduction. USPS was using it on an ongoing basis while the Justice Department tested Raytext and rejected it.

Glenn Metzdorf, department supervisor with USPS, said the post office acquired Raytext because it wanted a bridge system that would allow it to use more of the Lexitron VT word processors, which it likes. He did not like the software.

"It lost information quickly without any kind of warning," he stated. Metzdorf said the integrity of the package is based on its index pages, which comprise entire files covering multiple pages. "Those pages could get overwritten or lost and then you couldn't access documents."

He also complained about slow response times. "The way in which the command executed the writer especially is very, very slow," he said. "The way in which you access documents is also slow."

On the positive side, Metzdorf said that both the professional and typing staffs were happy with the package's ability to manipulate data once it was accessed.

Although Raytheon was attentive to Raytext problems, when repairs were required, they sometimes involved sending

(Continued on Page 77)

Essential to Productivity

OA Termed Solution to Woes

By Bob Johnson
CW New York Bureau

NEW YORK — Predicting there will be an office automation device for every office worker within 10 years, John W. King, president of the K/3 Group, said here recently that this equipment will be essential to office productivity, which he described as the "critical issue for the '80s."

Speaking at the DMW Group, Inc.'s "World Update '83" seminar, King told attendees that present estimates of installed base business personal computers and workstations is a little over a million. However, from about 1988 on the number of these devices in a given organization is likely to double. That fact, coupled with an estimated 60 million office workers by 1992, is a likely solution to the productivity problems industry now faces, he said.

King revealed that office workers today spend as much as one-fourth of their time on nonproductive activities, including paper shuffling, chatting and visits to the water cooler. Additionally, nearly 50% of their time is spent on nonproductive meetings. "Typically, less than one-third an office worker's time is spent on profes-

(Continued on Page 77)

Wordtronix Offers Full-Page WP

MINNEAPOLIS — Wordtronix, Inc. introduced a full-page word processor with tie-in to electronic typewriters.

The Serif ET typewriting system uses the daisywheel-styled electronic typewriter as the printer without giving up the features and the power of the Serif line of word processors.

This is accomplished by providing a keyboard for the Serif ET unit as well as the keyboard that is inherent with the electronic typewriter.

It is a full-page system that gives the operator an exact replica on the screen of what will be typed on the paper and allows two operators to use the system at the same time, the vendor said.

With a single drive, keyboard, Typeright 1 software and adapter board, the system costs $4,990, without the typewriter. The vendor is located at 9950 W. 74th St., Minneapolis, Minn. 55344.

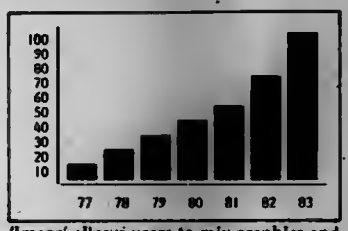
Graphics Integrated With WP

PORTLAND, Ore. — Microart Corp. has introduced a software program said to integrate advanced word processing capability with graphics.

The Image package allows the user to create bar charts, office forms, organizational diagrams, flow charts and line or block drawings. It can mix any of these graphics with text, a vendor spokesman said.

The package will run on the Televideo, Inc. 802, 802H and 950 systems and the Zenith Data Systems, Inc. Z89, Z90 and Z19 systems that run on the Digital Research Inc., operating system, CP/M.

Image is sold for $295. Micorart is located at Suite 961, 200 Market Building, Portland, Ore. 97201.



'Image' allows users to mix graphics and text with a letter-quality printer.

Accessories Offer WP for Typewriters

MOUNTAIN VIEW, Calif. — Chat Communications and Systel Computers, Inc. of San Jose, Calif., have jointly introduced plug-compatible accessories for electronic typewriters that will offer word processing and the ability to access automatically the telex, TWX and Bell systems networks, worldwide.

The Systel II consists of a 12-in. CRT terminal and a disk drive that connects directly to the electronic typewriter. The Chat II connects the Systel II to a printer and/or national and international networks.

The system allows businesses to upgrade familiar existing office equipment, the vendor said.

The system is available for approximately $5,000.

Chat Communications is located at 2438 Wyandotte St., Mountain View, Calif. 94043.

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THINK AHEAD

OA to Be Essential to Office Productivity: Exec

(Continued from Page 73)

sional activities and less than 10% on analysis and design work."

The speaker maintained that the proliferation of equipment in the office environment will allow much of this wasted time to be turned into increased productivity. He said the preponderance of raw computer power, as measured in millions of instructions per second, will be outside of the computer room and on the office worker's desktop and factory floor before 1985.

King also noted that DDP is "dying a very early death." He explained that DDP no longer makes sense considering the advent of the microprocessor and resulting personal computers and workstations with their increased capabilities. All this points toward increased use of this equipment and a potential increase in productivity, according to King.

He said the DP manager has lost control over procuring personal computer equipment. King said the DPer can no longer prevent users from getting a personal computer if they want one, and this ease of acquisition further supports the idea of increased productivity. If users can acquire computers more easily, they will be used more frequently.

The MIS manager's role in an attempt at better office productivity must take the form of policy and standards setting, King said.

What a user looks for in office systems are things such as the ability to do a better job in the eyes of his boss and/or customer and an easier way of performing tasks, according to King. He also expects creativity, teamwork and user-friendliness.

Local-area networks will play a major part in making productivity gains, King claimed. He said that initially they will be used for resource sharing and the eliminating of counterproductive paper handling.

He maintained that the technology of local-area networks is not necessarily an issue in office productivity. If it works and is supported, it should be used, King noted.

Government Agencies Call Raytext Slow, Cumbersome

(Continued from Page 73)

disk packs to California for debugging, he declared.

"I don't think it was thoroughly tested," he commented. "It shouldn't have ever been marketed."

Joe Riley, assistant director for the office automation service within the Justice Department's Office of Information Technology, said he tested Raytext for correspondence control and tracking and found it wanting.

He said it was "cumbersome" and "slow" when seeking a document created two weeks past and characterized the system as stopgap.

"In order to access a record that had been completed or form that had been created and stored, it was very cumbersome to have to go back to the index and find where a document might be in that index," Riley stated.

Raytext's lack of a forms creation capability meant that individual word processor operators had to create a number of blank forms, store them and then call up one at a time, which required keying in the necessary instructions, he added.

The Raytheon spokesman defended the system, saying, "Raytext was a relatively new product when installed at the post office in early 1981 and had some difficulties that every new project has in start-up."

Of the Justice Department rejecting Raytext, he said, "The industry would find nothing unusual about a customer changing its mind about a product in today's evolving market."

He claimed that problems with the USPS' system had been ironed out and the software revised.

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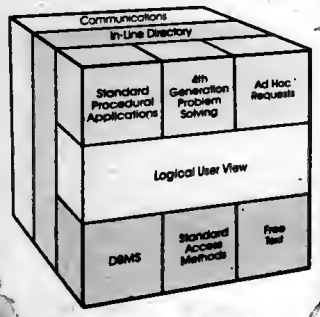

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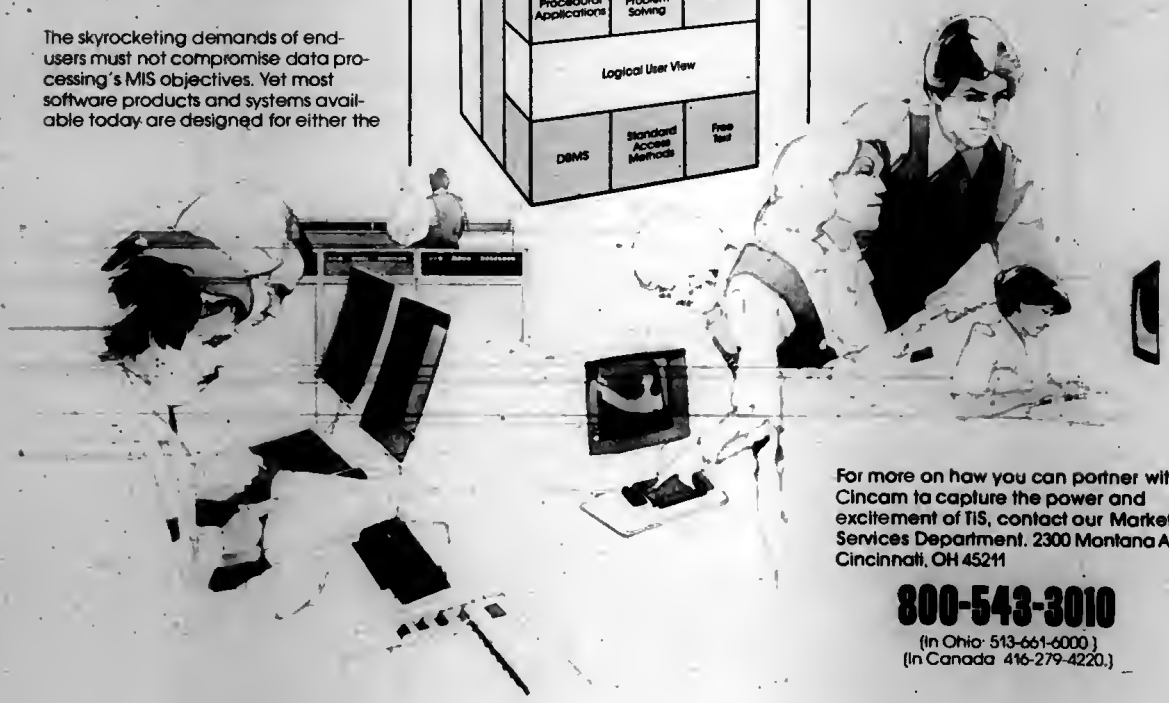

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Injunction Issued In First Test Of Copyright Law

By Paul Gillin
CW Staff

ATCHISON, Kan. — In a decision that should please software developers and owners, a district court judge here has issued a permanent injunction against a processing house charged with copying a program it administered and using it to compete directly with the program's owner.

The decision is believed to be the first involving a computer program under the Kansas Uniform Trade Secret Act of 1981, a law that is currently under consideration as a standard in several states.

Judge Morris P. O'Keefe Jr. entered a permanent injunction in Atchison County District Court against CWC, Inc., a Kansas City, Mo., service bureau; its president, Charles Carmack; Program Systems, Inc. (PSI); and its president, Rod Cook. O'Keefe also set a Jan. 25 date for awarding of damages in the case, which was brought by the Lockwood Co., a service bureau in Kansas City, Kan.

A defense lawyer said the decision will be appealed and that he may seek a writ of prohibition against the judge. "This litigation is not over with," said attorney Byron Fox.

But a co-counsel for the plaintiff

(Continued on Page 86)

Commerce Sees Services, Product Sales Up 18% in '83

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — U.S. computer industry sales of products and services should increase 18% this year, reaching an estimated total of $40.2 billion, according to the Commerce Department.

In its annual "U.S. Industrial Outlook" report, the department reported the value of 1982 industry shipments increased only 11.3% over 1981, well below the 15% Commerce had predicted at the year's beginning. The annual report attributed the disappointing year to the prolonged international recession and the strength of the dollar abroad.

'. . . total employment in the computer industry rose about 5% during 1982, to 351,000 workers . . . well below the 15% annual growth rate of total employment between 1977 and 1981 and reflected the softening demand in both the U.S. and major foreign markets.'

"Export markets slowed drastically, failing to cushion companies from the falloff in domestic demand as in past recessions," the department said, noting the industry's financial results through 1982 "reflected a mixed market picture worldwide.

"Relatively healthy growth continued in such products as desktop computers, associated peripherals and 32-bit . . . minicomputers, while demand for 16-bit minicomputers and mainframe computers and peripheral equipment destined for OEMs . . . slumped appreciably," the report said.

Although "most companies suffered from substantially lower or negative profit growth [and] in some, a decline in revenues," Commerce added that "most industry executives are cautiously optimistic that demand, which began to recover during the latter part of 1982, would continue moderate growth in 1983."

The inflation-adjusted 18% sales jump predicted for 1983 assumes "moderate recoveries" of U.S. and European economies for the year. American computer-related exports will increase 20% to $10.7 billion, Commerce said. However, imports will increase even faster, rising 35%, to $2.9 billion, according to the latest projection, which said "this trade will continue to include large volumes of peripherals for the small-computer sector of the market, particularly printers and disk storage from Japan."

Elaborating on industry international trade in 1982, Commerce noted the anticipated upturn in major European markets did not occur in 1982, resulting in only a 4.5% sales increase, to an estimated $8.9 billion, with computer parts exports growing approximately twice as fast as equipment exports. "Shipments to customers in West Germany, France and Italy fell markedly, while those to Japan rose 10%," the report said.

Turning to 1982 imports, Commerce reported the U.S. purchased $2.1 billion in foreign computer goods, a 30% rise from 1981. Japan replaced Canada as the chief supplier, accounting for nearly a third of these imports. This slight increase

(Continued on Page 82)

Rockwell, Lehman Brothers to Pay

OPM Fraud Case Winding Down

By Bill Laberis
CW Staff

NEW YORK — Thick briefs filed in U.S. District Court here last week represent the closing chapters in the OPM Leasing Services, Inc. swindle, with the mechanism now in place for lenders to receive about half the money of which they were bilked by the computer lessor.

Under two- and three-party agreements filed in bankruptcy court by OPM trustee James Hassett, Rockwell International Corp., OPM's biggest customer, and Lehman Brothers Kuhn Loeb, OPM's investment banker, will make cash payments totaling $3 million to the OPM estate. The money will then go into a larger fund earmarked for payment to 19 institutional investors defrauded of an estimated $200 million; primarily by former OPM principals Myron S. Goodman and Mordecai Weissman.

Additionally, both Rockwell and Lehman Brothers have agreed to forego claims against the estate. Rockwell, for example, said it will not exercise any early termination rights with respect to equipment leases it executed with OPM. Rockwell and Lehman Brothers, which will become the primary creditors of the estate should the OPM filings be approved in bankruptcy court, have also agreed to forfeit their share of over $12 million in distributions and repayments from the estate.

In the two-party agreement between OPM and Rockwell, Rockwell agreed to pay an additional $1.45 million to the OPM estate in settlement of claims made against Rockwell by OPM. Rockwell also agreed to release interests or liens on any subleases of computer equipment subleased to OPM by Rockwell during the period of the swindle.

According to Hassett, OPM's trustee, the two-party agreement "would avoid the resolution of difficult question of law and fact with respect to issues involving, among others, Rockwell's potential administration claims for nonpayment of sublease rentals."

A source familiar with the OPM settlements, as well as recent published reports, have confirmed that Rockwell, Lehman Brothers, OPM's legal counsel and two accounting firms have all agreed in principal to pay a total of $65 million to 19

(Continued on Page 80)

Justice Department Will Not Challenge Formation of MCC

WASHINGTON, D.C. — The U.S. Justice Department has decided not to challenge the formation of a joint computer technology research venture spearheaded by Control Data Corp.

Assistant Attorney General William F. Baxter, head of the department's Antitrust Division, said in a year-end announcement that the government plans no action against the venture based on the department's initial investigation. He added, however, that the decision does not necessarily apply to all future activities of the Microelectronics and Computer Technology Corp. (MCC)

MCC, the brainchild of CDC Chairman William Norris, currently lists 14 other participating firms, including Burroughs Corp., Digital Equipment Corp., Honeywell, Inc., Harris Corp., NCR Corp., Sperry Corp. and Xerox Corp. The participating firms are expected shortly to announce their selection of a chief executive officer of the venture, after which further details on MCC's operations will be forthcoming.

When MCC was announced early last year, Baxter indicated he did not oppose the joint venture in concept. But the Justice Department warned that MCC has a potential of lessening competition in research. Its future activities will be scrutinized on the basis of "the percentage of the industry that chooses to participate as shareholders in the venture, the identity of the shareholder firms choosing to participate in particular research projects and whether the costs and risks of particular research projects are of a magnitude that warrant a joint undertaking."

Responding to the government announcement, CDC last week said that "it is encouraging that the Justice Department agrees with our assessment that MCC, as it is envisioned, far from restricting competition will in fact encourage even greater competition without a loss of U.S. preeminence in electronics."

Slated for start-up within a few months, MCC will eventually amass operating capital of $50 million to $100 million, according to a CDC spokesman. It will initially undertake broad research programs in advanced computer architectures, software productivity, packaging and computer-aided design and manufacturing.

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Magnuson Drops Project

SAN JOSE, Calif. — In the wake of third-quarter losses totaling $14.2 million, Magnuson Computer Systems, Inc. has announced it will discontinue in-house development of a new generation computer, choosing to redirect its engineering effort to support of its current product line.

Moreover, the company expects the losses incurred in the last two years to continue into 1983, while company auditors are questioning Magnuson's ability to stay in business, according to a report the company filed recently with the Securities and Exchange Commission.

Meanwhile, the financially beleaguered mainframe manufacturer said it will pursue the acquisition of computer systems and peripherals from other companies in an attempt to offer a total system solution and leverage its existing investment in its end-user sales and service organization.

The result of these changes at Magnuson in its third quarter is the write-down of engineering and manufacturing equipment such that the company's net inventory value is now $412,000, according to company President Charles Strauch.

The $14.2 million in red ink, on third-quarter revenues of $4.5 million, was another in an unbroken string of quarterly losses going back to 1981, when Magnuson registered a $36 million operating loss for the year. The company attributed its bleak third-quarter results in part to the price erosion of the IBM 4300 series, against which Magnuson's processors compete.

Strauch said the company is still struggling "to get revenues to the point where we can generate positive cash from operations."

Recently the investment firm of Hambrecht & Quist purchased a controlling interest in Magnuson [CW, Nov. 29], a move the company claimed would set its financial house straight and send it down the road to recovery.

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OPM Swindle Approaching Final Chapters

(Continued from Page 79)

investors cheated by OPM, the largest of which is believed to be Crocker National Bank of San Francisco. Laywers for Crocker, Rockwell and Lehman have declined to comment on the proposed $65 million settlement.

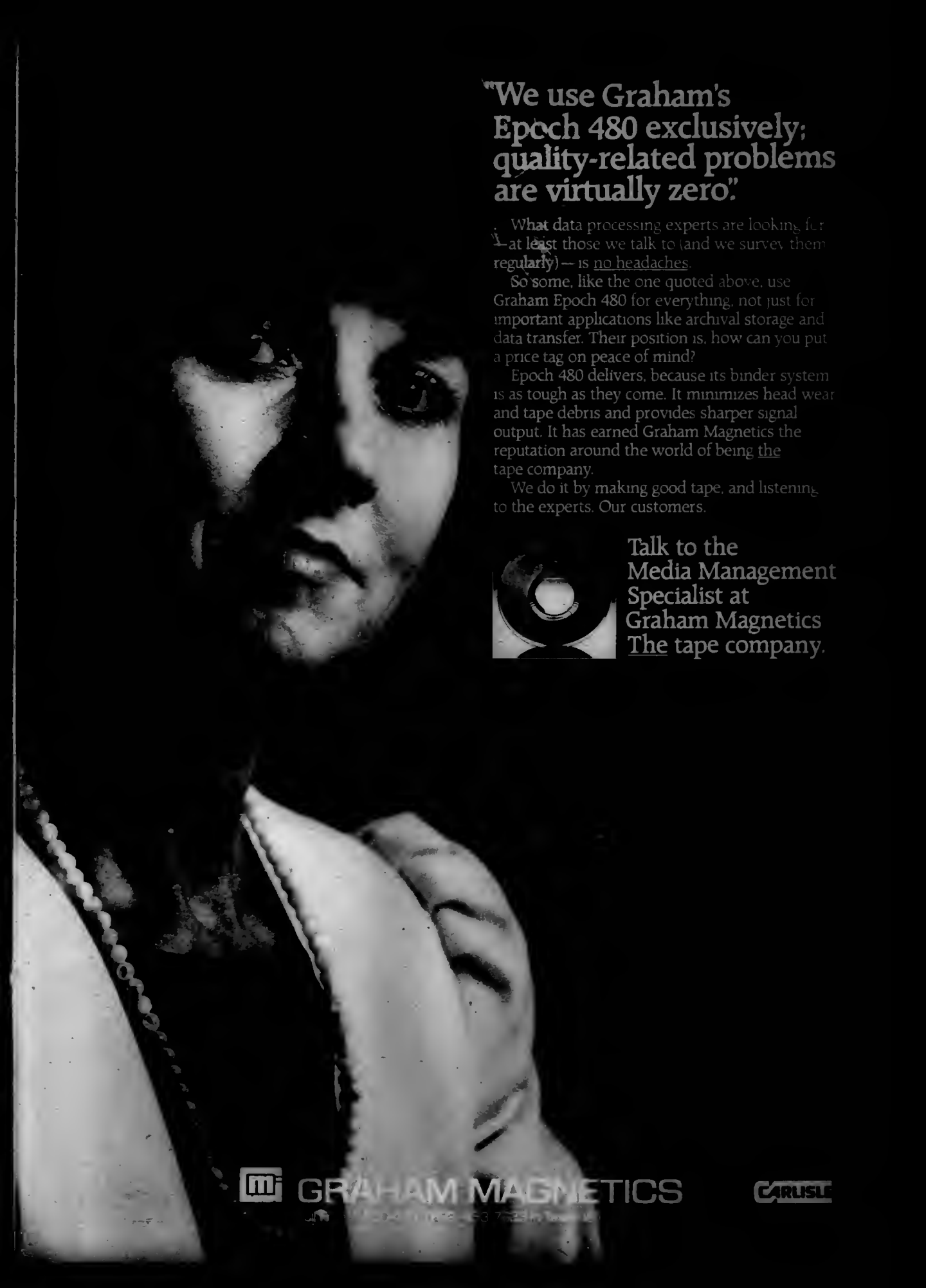
The insurers of Lehman Brothers and Rockwell will reportedly bear the brunt of the repayments, in amounts presumably corresponding with the degree of involvement, intended or otherwise, in the fraud. However, a provision of the proposed settlement is reported to include a clause wherein the five companies deny any acts of wrongdoing.

Half the Owed Amount

The $65 million represents about half the estimated $130 million that institutional investors are still owed from a total of $200 million OPM obtained from 1978 to 1981 with altered or completely phony computer leases.

OPM used the fraudulent leases, written out largely to Rockwell, to bilk investors of money they presumed was destined for the purchase of computers. Goodman and Weissman testified in December that much of the money they fraudulently obtained was given to various charities in the U.S. and in Israel [CW, Dec. 27].

Goodman and Weissman, cofounders of OPM and brothers-in-law, were sentenced to 12 and 10 years, respectively, in federal prison and were slated to begin serving those terms last week.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Services Firm, School Join Forces

CINCINNATI — Tominy, Inc., a computer services company here, has launched a joint venture with Ohio State University whereby the school's College of Administrative Science will assist in designing Tominy's products to be compatible with a broader line of CPUs.

The project will reportedly expand hardware operating environments for the company's software products to include Digital Equipment Corp.'s VAX minicomputers.

Currently, the company claims to support 475 installations of its Data Base-Plus on the IBM Series 1 minis, while in-house product development efforts have targeted other IBM systems exclusively.

Commerce Sees Sales Increase

(Continued from Page 79)

in exports and the "substantial growth" in imports narrowed the U.S. computer trade surplus to $6.7 billion in 1982, Commerce said.

The department's report continued that "total employment in the computer industry rose about 5% during 1982, to 351,000 workers. This increase fell well below the 15% annual growth rate of total employment between 1977 and 1981 and reflected the softening demand in both the U.S. and major foreign markets. Production worker employment also grew at less than its historic rate, climbing approximately 5% to 148,000 and representing about 42% of total employment.

The total plant and equipment expenditures of the top eight U.S. computer firms grew only 2% during 1981, to $3.7 billion, Commerce added, compared to a 37% increase during 1980. The department noted, however, that while three of the eight firms actually reduced spending below 1980 levels, the remaining five increased their expenditures an average of 18%.

Total 1981 research and development expenditures of 26 industry firms surveyed rose 15.3% above the previous year's level, to $3.8 billion. This rate of increase was slightly higher than the estimated 15.1% increase for all manufacturing sectors.

The long-term prospect for the industry, Commerce said, is for an 18% annual sales increase rate, compared to the 20% annual growth rate realized from 1958 to 1981.

Thirteen Companies Push For Tape Drive Standard

LAS VEGAS — Thirteen manufacturers have submitted a joint proposal calling for a standard format for quarter-inch cartridge streaming tape drives to achieve industrywide interchange of recorded cartridges.

The proposal, QIC-24, will be submitted to the American National Standards Institute and the European Computer Manufacturers Association for consideration as a worldwide standard. It was assembled at a recent meeting called by the Working Group for Quarter-Inch Drive Compatibility (QIC).

Companies endorsing the standard include 3M Corp., Computer Storage Technology, Inc., Western Digital Corp., Irwin/Olivetti and Cipher Data Products, Inc.

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Report Predicts Local Systems Mart Shake-Up

SAN JOSE, Calif. — The local communications systems market — including local-area networks, private branch exchanges, protocol converters and data switching systems — is on the verge of a major shake-up, with large DP vendors becoming the major force in the market, according to a study released here by Strategic, Inc. Key players in this market shuffle are expected to be IBM and AT&T and the Bell operating companies.

According to the report, the focus of competition is seen moving up from lower to higher levels of integration. The key to large-site competition reportedly will not be so much the provision of a particular solution as the ability to provide software that enables these solutions to function as components of a broader system.

To be successful, Strategic continued, vendors will have to have a variety of compatible solutions for voice and data traffic, resulting in a shuffle over the next few years of the players teaming up to cover all bases.

Large DP vendors, with IBM and its approach dominating, will be the main market force. Major implications are also seen for AT&T and the Bell operating companies, but they may be deterred by stiff competition from the opposite direction (voice), according to the report.

Distribution, the study said, is an emerging issue likely to become a determining factor in vendor selection. Major growth is expected in the market for gateways, interfaces and converters for integrating various vendor's equipment, thereby impacting bidding for large accounts.

"Impact of Broadband Local-Area Networks," which is based on a survey of 50 large-site users of local communications systems, is available for $20,000 from Strategic at Suite 215, 4320 Stevens Creek Blvd., San Jose, Calif. 95129.

Univac Sees Modest Rise In Fiscal '83

BLUE BELL, Pa — The continued softness in the world economy and an anticipated snail's pace recovery in 1983 have prompted Sperry Univac officials to predict "modest growth" for fiscal 1983, which ends March 31 for the company.

Joseph J. Kroger, company president, said that he expects revenues from computer operations in calendar year 1982 to increase 2% over 1981 to about $2.8 billion.

The value of new orders for computer systems and services, however, will be off by about 4% to $2.4 billion, Kroger predicted.

On a brighter note, Kroger noted that the company's defense business is booming. Univac's growth in this area is up about 20% over 1981 which projects to a $535 million increase.

As 1983 does not loom as a year of great recovery, Kroger said Univac will concentrate on productivity gains realized through additional automation of production facilities, "as well as continued cost control within all operations."

Univac recently signed a letter of intent to join in the Magnetic Peripherals, Inc. venture along with Control Data Corp. and Honeywell, Inc., whereby the three will pursue research of thin film storage technology.

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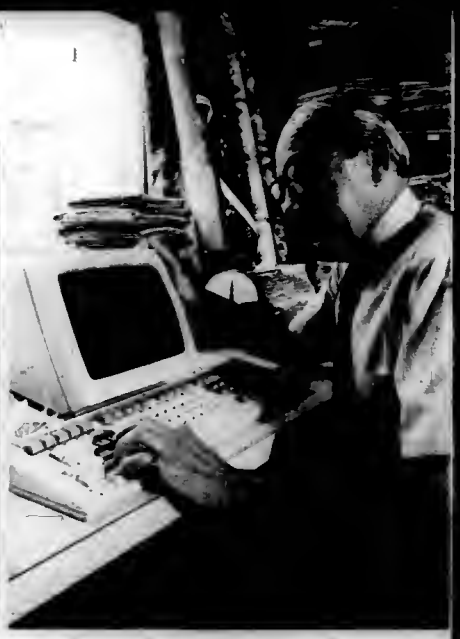

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CA Offers Trade-In On IBM 8100s

BOULDER, Colo. — Computer Automation, Inc. last week announced a trade-in program that will reportedly allow certain users of IBM 8100 computer systems to swap them for the company's Syfa distributed data processing systems for network applications.

D.H. Methvin, president of the minicomputer manufacturer, said the offer is aimed at users who have had problems either integrating the 8100 into their data processing networks or programming the machines for specific applications. He explained further that the program would be most applicable to users who had secured two or three 8100s for program development before committing themselves to larger orders and then encountered "significant or insurmountable" problems with the machines.

Trade-in terms will be arranged on an individual basis, although Methvin said that in some cases the company would allow an 8100 user to recoup their full purchase price when signing an order for a Syfa system. Trade-ins will not apply to users who have leased their 8100s, he added.

Further information is available from Computer Automation, located at 4890 Sterling Drive, Boulder, Colo. 80301.

Injunction Issued in Test Of Kansas Software Law

(Continued from Page 79)

said the decision helps to solidify the legal definition of a software package. "A lot of opinions in the computer area try to cross the bridge of whether a program is more than just numbers," said David Ryan, who is also a professor of law at Washburn Law School in Topeka, Kan. "The judge in our case didn't bother with that. He said it has independent economic value and that was good enough for him."

The Kansas law defines trade secret as "information including formula, pattern, compilation, program, method, technique or process that derives economic value . . . by not being . . . ascertainable by proper means by other persons who can obtain economic gain by its disclosure."

During a trial held in late December, Lockwood called on witnesses who testified that a tax analysis and planning program marketed by CWC was nearly an exact copy of a program owned by Lockwood, translated from Cobol into assembler code. In rendering his decision, Judge O'Keefe said, "It has to be considered that input, format, output and master code," are all covered by trade secret protection.

CWC attorney Fox argued that the programs contained similarities in output format only. "The court has already indicated you can't take out of a programmer's mind the style he's developed," he said. "There are some rudimentary similarities in terms of coding names being similar, but that has nothing to do with the operation of the program."

The suit alleged that CWC's Carmack, a PSI employee, copied a tax analysis program originally developed for Lockwood by PSI and used it to woo Lockwood clients away to CWC, a company he created along with other PSI employees. One former Lockwood customer, Sumner County, Kan., canceled its contract with Lockwood last summer and signed on with CWC, the suit alleged.

Lockwood charged Carmack and other PSI employees with using a bootlegged copy of the company's tax analysis program to establish CWC. Early last year, Carmack wrote a letter to a number of county governments, including several Lockwood clients, informing them that he would be starting his own company Jan. 1, 1983, "with the principal concern of providing DP services to county government," the suit alleged.

Richard Senecal, Lockwood's attorney, claimed Carmack began pursuing Lockwood customers, promising them they could convert to his program without making any changes in their current operations. Senecal said officials at Lockwood became suspicious when they learned that Sumner County was using a tax program very similar to the one they offered.

Lockwood filed suit Oct. 5 seeking a permanent injunction and damages "in excess of $10,000." At issue was the comparability, of the Lockwood program, written in Cobol, and the CWC version written in assembler code. At the December trial, programming experts called by the Lockwood attorney testified that the master code of both versions was fundamentally the same.

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Corrections

The stock performance of Management Science America, Inc. (MSA) was incorrectly represented in the Dec. 27 "Computerworld Stock Trading Summary." The change in stock price shown did not take into account that MSA's stock had split two-for-one on Dec. 1.

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Massport OKs Foreign Trade Zone for High Tech

By Tom Henkel
CW Staff

BOSTON — Plans for a $130 million high-technology research and production facility near Logan Airport here got a boost recently when the Massport board of directors approved plans to make part of the area a foreign trade zone.

The foreign trade zone classification, which will allow tenants of the facility to avoid paying U.S. import duties on parts and components as long as they remain in the foreign trade zone, is an extension of an already existing foreign trade zone at Boston's Commonwealth Pier.

Massport officials say 490,000 square feet in two of the proposed buildings, offically called the Massachusetts Technology Center, will be set aside as an foreign trade zone for tenants to manufacture, store, distribute and repair high-technology products including business machines, home computers, medical devices and other electronic equipment, Massport said. The project developer said the first of the buildings will be up late next year, with the remainder of the project completed three or four years later, Massport said.

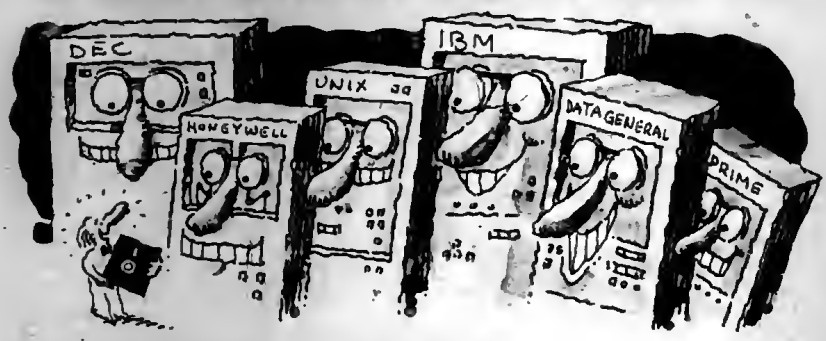
The proposed center will be the first foreign trade zone abutting a major airport and one of the few that allow vendors to repair as well as manufacture goods, according to Massport.

By setting up shop in the foreign trade zone, manufacturers of computers and other high-technology items can reap three major benefits. First, firms can stockpile imported components in a duty-free environment and pay duties only as items are brought into the U.S. Second, firms can manufacture and ship items abroad from the foreign trade zone, thus avuiding payment of any U.S. import duties. Finally, vendors of products composed chiefly of imported components can often pay less in U.S. tariffs by importing a finished product, rather than importing components and assembling the product domestically. By assembling products in the foreign trade zone, vendors can significantly reduce their import costs, according to Chris Koelfgen, president of a San Jose, Calif., foreign trade zone that owes about 60% of its business to Silicon Valley computer firms.

Planned for the Bird Island Flats area adjacent to Boston's Logan Airport, the technology center project will be incorporated into an air cargo facility that already serves some 1,000 high-tech firms each year.

There are currently 80 other foreign trade zones throughout the country. While some are devoted to other types of manufacturing, such as the Volkswagen Rabbit assembly plant in New Stanton, Pa., the foreign trade zone division of the U.S. Department of Commerce said that aside from the proposed Boston facility, two other foreign trade zones have a high concentrentation of high-technology clients. Those foreign trade zones are located in San Jose, Calif., and New Bedford, Mass.

A SPREADSHEET FOR GROWN-UPS.



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Exec Demand In High Tech Up

By Patricia Keefe
CW Staff

NEW YORK — Demand for electronics executives earning in excess of $75,000 per year rose to 14% of total demand for executives during the fourth quarter of 1982, according to Korn/Ferry International's 44th quarterly survey, called "The National Index of Executive Vacancies." While a point above the 1981 year-end figure, the figure also indicates a one-point drop in demand from third-quarter 1982.

That slight drop is blamed on the continued decline in semiconductor accounts, and a recovery is not expected in this segment until the second or third quarter of this year, the survey said. However, the electronics, aerospace and military sectors are said to be weathering the recession well, and there is a continuing need for research and development executives, particularly within software design.

Electronics, along with consumer products and retailing, is expected to lead the country out of the recession, the study said. New venture start-ups within both hardware and software continued to emerge during 1982, and overall executive hiring is expected to pick up by mid-year to a rate of 10% to 12% above 1982 for the full year. Korn/Ferry also expects a full recovery to begin during the first quarter of 1984, with senior executive hiring rising 15% to 17% for the year.

The survey noted that the electronics industry is "in the throes of fast-paced change and [is] facing stiff competition," so that, "despite layoffs, electronics and high-technology companies are aggressively recruiting senior-level executives to expand product lines and to direct market diversification." These companies were particularly active in seeking marketing executives to lead them in new directions, Korn added.

The report is based on a quarterly survey of 750 client firms. More information is available from Korn/Ferry at 277 Park Ave., New York, N.Y. 10172.

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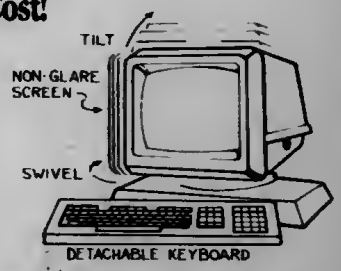

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- **Procom Sales,** Elk Grove, IL (312) 860-1028
- **The Tricom Group,** Hicksville, NY (516) 681-1222
- **Peripheral Business Systems,** Kirkland, WA (206) 823-6661
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Fastest Growing Sector

Study: Field Service Thrives

MOUNTAIN VIEW, Calif. — Revenues from computer field service and maintenance are growing faster than revenues for the computer business in general, according to a recent report from Input, Inc.

The "1982 Field Service Annual Report" states that this formerly little-recognized segment of the computer industry now accounts for almost 20% of equipment vendors' revenues. Even more significant, the study said, field service revenues are more resistant to economic declines and make up a more stable contribution to the bottom line.

Vendors will need to adjust to new difficulties caused by the proliferation of microcomputers, the report noted. Their low cost makes on-site visits by field service engineers prohibitive. However, the 306 users interviewed indicated that corporate spending on micros will increase by 60% in 1983, compared to an 8% increase in spending on mainframes.

The study also noted large differences in service pricing for similar equipment. These can be traced to reliability factors, costs of servicing different types of equipment and different approaches to pricing, the study said. However, the field of software maintenance has been seriously underpriced, it continued.

The report costs $5,000 from Input at 1943 Landings Drive, Mountain View, Calif. 94043.

Phone Construction Funds Seen at $15.3 Billion in '83

NEW YORK — The Bell operating companies have projected they will spend $15.3 billion in construction funds this year to expand, improve and maintain communications services.

Additionally, American Bell, Inc., the AT&T subsidiary, will spend about $1.5 billion for various construction programs, making total planned construction expenditures about 2% lower than last year.

Of the $15.3 billion the Bell companies are expected to spend on construction, about 62% is so-called growth dollars, including continued increased in fiber-optic cable placements.

AT&T blamed the decreased spending on several factors. One of these is the effects of the Federal Communications Commission's (FCC) Computer Inquiry II decision, which shifts responsibility for purchasing and providing new customer premises equipment of the operating companies to American Bell as of Jan. 1. American Bell intends to sell rather than lease certain of its customer premises equipment, thereby reducing capital expenditures, the company has predicted.

Further, reducing the construction program is the continuing effect of the FCC's order for Bell companies to charge for station connections, thereby allowing them to recover the costs of new installations at the time work is done rather than capitalizing the costs and recovering them over time, AT&T claimed.

Lastly, construction programs will lag somewhat due to the slower than expected economic recovery.

CDC, MLC Sign Third-Party Pact

MINNEAPOLIS — Control Data Corp. has announced a master agreement with Minneapolis Leasing Corp. (MLC) under which CDC is offering MLC third-party leases to users of CDC's large IBM-compatible peripheral disk storage subsystems. The agreement between the firms calls for CDC to offer standard equipment maintenance to its third-party lease customers.

For example, MLC leases on a CDC 3350X disk drive are available for periods of 24 to 48 months at prices 5% to 15% below current CDC operating leases, depending on subsystem configuration.

According to CDC, users may also qualify for an investment tax credit with the MLC lease, further reducing the lease cost.

Formed last year, MLC has arranged a $50 million line of credit from Citicorp Leasing, Inc. for the purchase and lease of CDC disk systems.

Xerox Program Assists Vendors

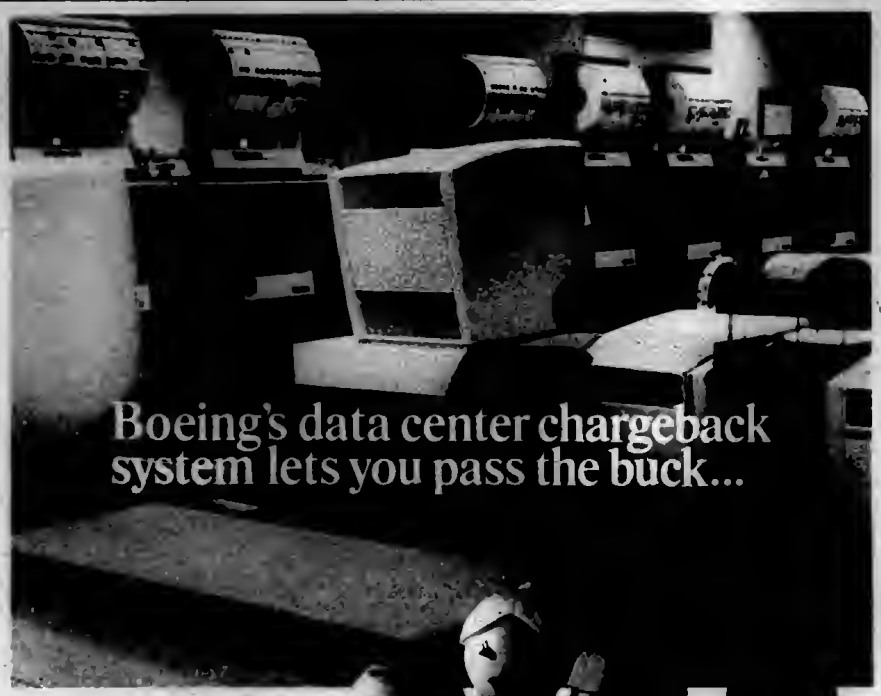
DALLAS — A program encouraging third-party vendors to develop products for use with Xerox Corp. computers has been unveiled by the firm's Office Products Division.

Under the Vendor Involvement Program, the division will assist vendors in marketing developed products through Xerox distribution channels.

The division will select certain products requested by its distribution channels and jointly promote them with the manufacturer.

The division also is planning to publish a program directory listing compatible software and hardware for the company's 820-II personal computer and the availability of services such as custom programming.

Xerox's Office Products Division is located at 1341 W. Mockingbird Lane, Dallas, Texas 75247.



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Nickels & Dimes

Promedics Data Corp. has received $1 million in financing through Medical Software Development, a research and development limited partnership.

$ $ $

Cray Research, Inc. has filed a registration statement with the Securities and Exchange Commission covering 750,000 new shares of common stock. The offering will be made through a group of underwriters managed by L.F. Rothschild, Unterberg, Towbin, Rothschild, Inc.; and Piper, Jaffray & Hopewood, Inc.

$ $ $

Dataram Corp. has sold 10% of its stock in CSP, Inc., retaining approximately 21% of the firm's outstanding stock.

$ $ $

Analog Devices Enterprises has invested $500,000 in **Quantitative Technology Corp.** of Portland, Ore., in return for convertible securities.

Hogan Systems, Inc. has completed a public offering of 1.6 million shares of common stock at $21 per share through Hambrecht & Quist and Alex. Brown & Sons.

$ $ $

Analogic Corp. plans to file a registration statement with the Securities and Exchange Commission relating to a proposed offering of approximately 600,000 shares of its common stock.

$ $ $

STC Ultimatic Systems, Inc. and **STC Systems, Inc.**, subsidiaries of **Storage Technology Corp.**, have formed a partnership with private investors to expand the company's turnkey business. Financing was arranged by L.F. Rothschild, Unterberg, Towbin of New York.

$ $ $

Convergent Technologies, Inc. has announced a three-for-two common stock split.

Executive Corner

• James MacGuire has been named president and chief operating officer of Ibis Systems, Inc.

• Velma A. Stewart has been promoted to comptroller of Mallinckrodt, Inc.'s Corporate Administration Division.

• Frank B. Lee has been promoted to vice-president of National CSS, Inc., an information services company of the Dun & Bradstreet Corp.

• David A. Young has been promoted to vice-president, finance and administration, and chief financial officer and Charles E. Butler has been appointed vice-president and general manager of European operations for MSI Data Corp.

• Sidney E. Wing has been promoted to vice-president, business development, at Interstate Electronics Corp.

• Bernard Balter has been named vice-president and general manager of Dataguard, a division of Novo Communications, Inc.

• Joseph Squarzini has been named vice-president and manager, telecommunications and information processing operations, at General Electric Information Services Co., a General Electric Co. subsidiary.

Supershorts

Frost & Sullivan, Inc. will introduce the "Computer Vertical Market Industries Newsletter" in January. The eight-page monthly will analyze selected vertical markets in two consecutive issues, covering such topics as market structure; current and future data processing applications; suppliers and their products; recommended selling, advertising and promotion techniques; industry meetings and publications; and market size and growth projections.

— — —

Kearney-National, Inc. has formed a new subsidiary, Wabash Datatech Australia Pty. Ltd., 25 George St., Homebush, N.S.W., Australia.

— — —

Perkin-Elmer Corp. has established CAD/CAM Operations, a new business unit for the company's Technical Systems Division. The unit will be located at 214 Third Ave., Waltham, Mass., and expects to be operational in early 1983.

— — —

M/A-COM Laboratories will become part of M/A-COM, Inc.'s recently formed M/A-COM Development Corp., Rockville, Md. M/A-COM Laboratories will change its name to M/A-COM Research Center and its director, Dr. L.S. Golding, will continue in his present position in addition to becoming a vice-president of M/A-COM Development Corp.

— — —

Hitek Development, Inc., Los Gatos, Calif., is offering new marketing and management services to U.S. companies wishing to begin operations in Europe. Available services include planning and implementation of advertising, sales, marketing, funding and site selection as well as assistance in executive-level search and joint venture and cross-licensing with European firms.

— — —

American Satellite Co. (ASC) and Mitel Corp. have signed an agreement in principle to form a new U.S. specialized carrier that will combine ASC's satellite transmission capabilities with Mitel's long-distance voice, data, video conferencing and value-added services via satellite to business users. ASC will own 75% of the carrier, Mitel, 25%. Service is expected to begin in early 1984.

— — —

Evans and Sutherland Computer Corp. has donated PS 300 graphics systems to the University of North Carolina, Chapel Hill, N.C.; Lehigh University, Bethlehem, Pa.; University of Illinois, Urbana-Champaign, Ill.; University of California at Los Angeles; University of Wisconsin, Parkside, Wis., and Louisiana State University, Baton Rouge, La.

MCI Forms Subsidiary

WASHINGTON, D.C. — MCI Communications Corp. has formed MCI International, Inc. to manage its international voice and data marketing efforts.

Operating as a wholly owned subsidiary of MCI Communications, MCI International will have two operating companies; MCI International Telecommunications, responsible for implementing the company's international voice marketing strategy; and Western Union International, Inc., which will continue to serve the traditional international record market.

MCI International and MCI International Telecommunications will be headquartered in Rye, N.Y.

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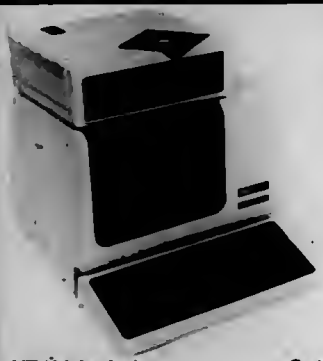

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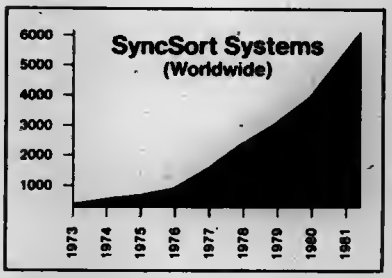

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Department of Mathematical Sciences
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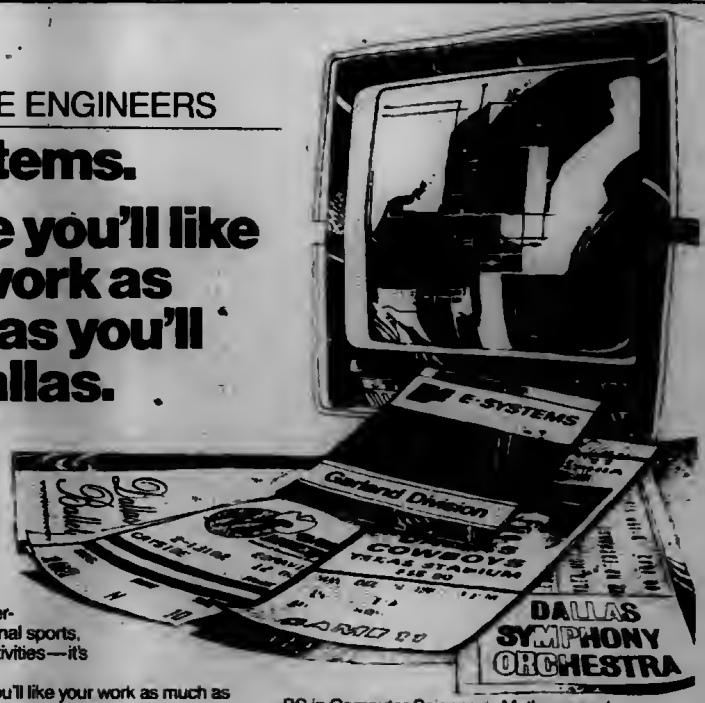

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Send an SF 171 to: Wm. T. Detending, Dept. of Justice, Justice Management Division, Justice Computer Service, Rm. 4003, 425 I Street N.W., Washington, DC 20530. An EOE

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DATA PROCESSING MANAGER

$650MM Southwestern Indiana bank seeks an experienced individual to head Data Processing subsidiary.

IBM 4341-2 DOS/VSE system currently in use provides batch and on-line services to approximately 30 banks. Center support on-line ISF, ATM, Burroughs, and NCR teller machines, on-line programming, and Proof of Deposit, employing approximately 50 people.

Applicant should have good technical skills, administrative ability and be capable of interfacing with user banks.

Excellent salary and comprehensive benefits package with incentive opportunities.

Please send resume to: John Oberholtzer
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30 N.W. Third Street
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For prompt consideration, please call Gene Ruppel COLLECT at (609) 234-1100. Or forward your resume and salary history/requirements to his attention at: CSC, Defense Systems Division, P.O. Box N, Dept. 1206CW, Moorestown, NJ 08057.

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Data Processing

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The selected individual will initially be responsible for the conversions of large, complex IBM CMS software products to DOS.

Applicants must have strong DOS assembler background and a knowledge of access methods at the assembler level. A knowledge of a variety of DOS versions would be an advantage.

SPSS, Inc., is a unique company where employees enjoy a progressive work environment and outstanding benefits, including 4 weeks vacation a year. If you would like to be considered, principals only, please send your resume, including salary requirements, to:

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Chicago, IL 60611

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Applications are invited for two (2) tenure-track full-time undergraduate teaching positions in computer science starting August 1983. Rank and salary dependent upon experience and qualifications, up to $35,849 for standard nine-month contract. Master's degree in computer science required. Ph.D. in computer science preferred. Business, industrial or teaching experience required. Applications accepted until positions are filled. Send vita, including unofficial transcripts, and letters of recommendation to Prof. Ralph E. Kuhn, Chairman, Computer Science Search Committee, Lehigh Harvey State College, Lehigh Haven, PA 17745. *An affirmative action/equal opportunity employer*

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Individual needed with strong background for manufacturing concern. Language RPG, MAPICS and/or System 38 experience a plus. Require resume and references in addition to application. Please send resume to:

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Personnel Department
6161 Lake Ellenor Drive
Orlando, FL 32809
(305) 859-3350

PROGRAMMER ANALYST

A city-owned major medical trauma facility located in central Texas is seeking a Programmer Analyst. Applicants must have college courses equivalent to an Associate's degree in Data Processing plus three years of progressively responsible business systems programming. Experience in DOS/VSE, CICS/VS and DL-1 is desired. Interested applicants may call or write

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601 East 15th Street
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Data Processing

MVS/VM Systems Specialists

Computer Sciences Corporation, System Sciences Division, a leader in providing IBM systems programming support to NASA's Goddard Space Flight Center for the past 12 years, has excellent long range opportunities for MVS/VM specialists. These individuals would join an interdisciplinary team that is assisting in the procurement of multiple CURRENT generation IBM PCMs to replace IBM S 360s.

This is an unusual opportunity to be involved with the Orbit and System Support Operation, located in Seabrook, Maryland, in planning for a new system and influencing the system features being procured. The individuals selected for these positions will become the nucleus of a systems programming group that is being established to support the transition to, and operation of, this new facility. Formal, ongoing education and Share/Guide participation will be provided to help individuals maintain current state-of-the-art product awareness.

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Computer Sciences Corporation offers competitive salaries and an excellent benefits program. Interested candidates are invited to forward resumes to Mr. Wayne Ewing, Staffing Department CW-461 or Call TOLL FREE 800-638-0842 or COLLECT (301) 589-1545.

CSC

SYSTEM SCIENCES DIVISION
8728 Colesville Road
Silver Spring, MD 20910

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PROGRAMMER/ ANALYSTS

Our Corporate Data Processing Department located in Neenah, Wisconsin is currently expanding and will be looking for several systems professionals. Working in an aggressive MIS organization you will be able to enhance your professional background while solving business management problems through the development of high level user friendlier business systems.

Program development is performed on a Burroughs 1985 dual processor using COBOL in an on-line environment. Qualifications include 3 to 6 years of COBOL programming and system design experience (preferably manufacturing oriented) with a college or technical school business data processing degree. Customer order entry or inventory control systems experience a plus.

We offer a competitive salary and benefits package and opportunities for future growth. Qualified candidates should submit a resume and salary requirements in strictest confidence to:

Corporate Personnel
MENASHA CORPORATION
P.O. Box 367 Neenah, WI 54956

DATA SYSTEMS
Computer Services Specialist

San Diego City Schools
Salary $30,348 to $38,736

Applications are being accepted for the above managerial position. The position is responsible for planning, organizing, and directing city schools student records section in the data processing department. Successful candidate will possess. Combination of training and experience equivalent to Bachelor a degree in Information Systems, Business, Public Administration, Education, or related field, experience in a large scale computer environment, and considerable supervisory experience. Experience with automated student records systems is required. Submit detailed resume to:

Personnel Administration Department
San Diego City Schools
4100 Normal Street
San Diego, CA 92103
(619) 293-8152

Application materials and position description will be provided to applicants for completion and return. Must receive application or resume by 2-7-83

PROGRAMMER ANALYST

Our growing data processing department is looking for an IBM System 38 programmer with well-rounded background in manufacturing applications. The programming involves the design of new applications and maintenance to diverse existing applications (MAPICS and in-house).

Applicants should have 2 years MAPICS experience with a minimum of 5 years in programming.

Interested applicants should please send a resume, stating current salary, to Mr. Tom Bugden, Personnel Administrator, Kontron, Inc., 9 Plymouth Street, Everett, MA 02149. An equal opportunity employer.

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COMPUTER SCIENCE- Two computer science tenure-track faculty positions available beginning August 15, 1983. With over 500 undergraduate majors and a new master's degree program a separate Department of Computer Science will be established on July 1, 1983. Senior candidates, who specify an interest, may be considered for the headship. Ph.D. in computer science or a closely related field, enthusiasm for teaching, potential and motivation for research, and recent professional computer science experience are highly valued. Candidates with the ABD or an M.S. in computer science will be considered for junior level positions. Rank and salary commensurate with qualifications and experience. Facilities include IBM 4341 (MUSIC and CMS), IBM 370/155 (OS Virtual Machine), PDP 11/44 and 11/45 (RSTS/E), plus several microcomputers. Complete resume, unofficial transcripts, and three letters of recommendation should be forwarded to **Office of Academic Affairs, Computer Science Search Committee, Western Kentucky University, Bowling Green, KY 42101.** An Affirmative Action/Equal Opportunity Employer.

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Our requirements include an undergraduate degree with at least seven years experience which should include a proven record of Project Leader and management capabilities. Experience with an NCR-VRX environment as well as Data Base and Data Communications skills is preferred.

For confidential consideration for this position, please submit your resume and compensation history to:

CW-84055
Computerworld
Box 880
Framingham, MA 01701

Systems Analyst

The City of Gainesville, Florida has an opening for a Systems Analyst with experience in financial applications. The successful candidate will possess strong planning and analytical skills and will participate in the design of an integrated financial information system in an interactive DEC computer system environment. Qualifications include a 4 year degree plus 4 years experience in a related field or any combination of education and experience. Send your resume with salary requirements by 5 pm, February 7, 1983 to **City of Gainesville, Personnel Department, P.O. Box 490, Gainesville, FL 32602.**

Mini Computer Technical Mgr: Supervises 2-5 programmer consultants in system generation & design, functional specs, coding, testing & all implementation phases of all projects. Resolves problems, writes flow charts, codes, tests & modifies programs. Analyzes, reviews & rewrites programs for increased efficiency or to adapt to new requirements. Computes all documentation. Must possess solid background using NEC Computer as well as a variety of hardware & software. PDP, DEC, IBM, BASIC & FORTRAN. Must have a BS in computer science & at least 1 yr exp. in computer technical mgmt. 40 hrs/wk. 3-5. $27,500 yr. Send resumes to Box CW 900, 810 7th Ave, NYC 10019.

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11140 Rockville Pike
Rockville, MD 20852

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Send resume to

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City of Industry, Ca. 91749

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Responsibilities include ADABAS software maintenance, assisting with data base design, and security and recovery procedures. The ideal candidate will have excellent interpersonal skills and prior experience with large data bases. Knowledge of ADAMINT or NATURAL is a plus.

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EOE M/F

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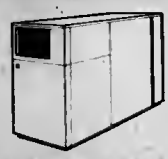

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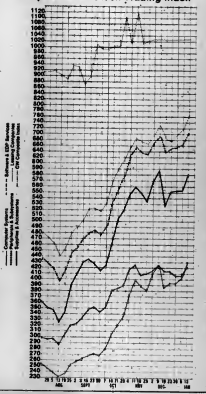

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CLOSING PRICES WEDNESDAY, JANUARY 12, 1983

All statistics compiled, computed and formatted by TRADE QUOTES INC Cambridge, Mass. 02139

EXCH		1982-83 RANGE (1)	CLOSE JAN 12 1983	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	17- 39	33	+3 3/8	+8.0
N	BURROUGHS CORP	28- 48	49 5/8	+4	+8.8
O	COMPUTER AUTOMATION	7- 17	14 1/4	+ 1/8	+0.8
N	CONTROL DATA CORP	21- 42	38 3/4	+3	+8.7
O	CRAY RESEARCH INC	20- 45	39 1/2	+3	+8.3
N	DATA GENERAL CORP	20- 59	44 3/4	+4 3/4	+11.8
N	DATAPOINT CORP	11- 24	18 3/8	+1 3/8	+7.8
N	DIGITAL EQUIPMENT	62-113	94	+4 3/4	+5.0
A	EECO INC	8- 11	10	+1 1/4	+14.3
N	ELECTRONIC ASSOC.	9- 12	11 3/8	+1 5/8	+16.8
O	FLOATING POINT SYST	16- 30	25 3/8	+1	+0.8
O	FOXBORO	22- 40	40	+4 5/8	+13.0
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 8	5 5/8	- 1/8	-2.1
O	HARRIS CORP	20- 43	41 1/8	+4 3/8	+11.8
N	HEWLETT-PACKARD CO	36- 87	77	+4	+5.4
N	HONEYWELL INC	60-104	92 1/4	+8 5/8	+10.3
N	IBM	55- 98	96 1/8	+2 1/8	+2.3
O	IPL SYSTEMS INC	5- 8	6 1/4	+ 1/4	+4.1
O	MAGNUSON COMP SYSTS	3- 16	2 3/4	- 5/8	-18.5
N	MANAGEMENT ASSIST	7- 18	12 3/8	+ 5/8	+5.3
O	MINI-COMPUTER SYST	1- 4	3/8	- 1/4	-40.0
O	MODULAR COMPUTER SYS	8- 13	11 1/4	- 3/8	-3.2
N	MOHAWK DATA SCI	10- 18	15 3/4	+ 7/8	+5.8
N	NCR	38- 85	81 1/2	+6	+8.0
N	PERKIN-ELMER	17- 37	30 5/8	+2 3/8	+8.7
N	PRIME COMPUTER INC	15- 40	40	+4 5/8	+13.0
N	SPERRY CORP	21- 37	34 1/4	+1 1/4	+3.7
O	TANDEM COMPUTERS INC	14- 38	25 7/8	+1 3/4	+7.2
N	TEXAS INSTRUMENTS	71-151	135 3/8	+9 5/8	+7.1
A	WANG LABS "B"	13- 39	39	+5	+18.8
A	WANG LABS "C"	11- 34	33 1/2	+4 1/8	+14.0
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	22- 30	29 1/2	+2 3/4	+10.2
N	COMDISCO INC	13- 40	40	+5 7/8	+17.2
O	COMMERCE GROUP CORP	1- 4	1/4	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	3/8	0	0.0
O	CONTINENTAL INFO SYS	5- 20	14 1/2	+2 1/2	+20.8
N	DPF INC	5- 13	9	- 1/8	-1.3
O	ITEL	1- 8	7/8	- 5/8	-41.6
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 37	37	+3	+8.7

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH; B=BOSTON
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

EXCH		1982-83 RANGE (1)	CLOSE JAN 12 1983	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 6	3 1/2	+1 1/4	+55.5
O	ADVANCED SYSTEMS INC	5- 18	18 1/4	+ 1/2	+2.8
O	AGS COMPUTERS INC	7- 17	15 1/2	+ 3/4	+5.0
N	ANACOMP INC	5- 18	15 7/8	+1	+6.7
O	ANALYSTS INTL CORP	5- 8	8	+ 1/2	+6.6
A	APPLIED DATA RES.	10- 42	[illegible] 3/4	+1 1/8	+2.8
O	ASK COMPUTER SYSTEMS	18- 27	24 3/8	+1 3/8	+5.8
O	[illegible] COMP IND	1- 6	2 7/8	+ 1/8	+4.5
N	AUTOMATIC DATA PROC	31- 38	37 1/2	+2	+5.5
O	CGA COMPUTER ASSOC	5- 10	9 3/4	+1 1/4	+14.7
O	COMPUTER ASSOC INT'L	12- 38	37 1/2	+3 3/4	+11.1
O	COMPUTER HORIZONS	1- 3	6 1/4	+3 1/2	+37.0
O	COMPUTER NETWORK	4- 8	7 5/8	+ 1/4	+3.2
N	COMPUTER SCIENCES	11- 20	17 3/8	- 7/8	-4.7
O	COMPUTER TASK GROUP	8- 18	17	+1 1/4	+7.8
O	COMPUTER USAGE	2- 7	6 1/4	+ 3/4	+13.6
O	COMPUTONE SYSTEMS	13- 30	26 3/4	- 1/8	-0.4
O	COMSERV CORP	11- 20	18	-1 1/8	-7.0
O	COMSHARE	8- 18	6 7/8	- 1/8	-1.7
N	CULLINANE DATABASE	12- 27	27 1/4	+2 7/8	+11.7
O	CYCARE SYSTEMS INC	8- 18	14 1/4	0	0.0
O	DATA DIMENSIONS INC	1- 8	1/4	0	0.0
O	DATATAB	0- 4	5/8	0	0.0
O	DYATRON CORP	3- 4	3	- 1/8	-4.0
N	ELECTRONIC DATA SYST	19- 50	49 7/8	+3	+6.4
O	INFORMATICS INC	10- 24	20	- 3/4	-3.6
O	INSYTE CORP	1- 3	2 1/4	+ 3/8	+20.0
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 8	6 1/4	- 1/4	-3.8
N	LOGICON	13- 29	28 3/4	- 1/8	-0.4
O	MGMT SCI AMER INC	5- 24	23 3/4	+5	+26.6
O	MATHEMATICA INC	12- 18	18 1/4	+4 1/4	+20.3
O	MATHEMATICAL APP GRP	12- 16	16	0	0.0
O	NATIONAL DATA CORP	13- 28	18 3/8	-3 5/8	-16.7
O	PANSOPHIC SYSTEMS	8- 20	19	+2	+11.7
O	PLANNING RESEARCH	6- 11	11	+1	+10.0
O	PROGRAMMING & SYS	4- 3	2 7/8	0	0.0
O	REYNOLDS & REYNOLDS	17- 38	33 3/8	+3 3/4	+8.0
O	SEI CORP	31- 49	42	+3 1/2	+9.0
O	SHARED MEDICAL SYST	26- 55	52 1/4	-1 1/8	-2.1
O	SCIENTIFIC COMPUTERS	8- 13	11	0	0.0
O	SOFTWARE AG	9- 17	10 1/8	- 3/8	-3.5
N	TYMSHARE INC	12- 30	30 1/2	+2 1/8	+11.5
A	URS CORP	10- 17	18 7/8	+1 7/8	+13.8
N	WYLY CORP	7- 12	8 3/4	+ 1/2	+6.4
	PERIPHERALS & SUBSYSTEMS				
N	AM INTERNATIONAL	1- 15	2 1/2	+ 1/4	+11.1
A	ANDERSEN JACOBSON	6- 24	23 3/8	+3 3/4	+19.1
O	AUTO-TROL TECHNOLOGY	6- 16	10 1/2	+1 1/4	+13.7
O	BANCTEC INC	7- 33	18 3/8	+2 3/8	+22.8
A	BEEHIVE INT	4- 9	6 7/8	- 1/8	-2.7
N	BOLT BERANEK & NEW	8- 30	21 5/8	+ 1/8	+0.6
O	CAMBEX CORP	3- 9	2 1/8	- 1/8	-5.5
N	CENTRONICS DATA COMP	6- 17	12	- 1/4	-1.8
A	CETEC CORP	4- 6	6 1/8	+ 5/8	+11.3
O	COGNITRONICS	5- 11	10 1/8	+3 1/2	+52.8
O	COMPUTER COMMUN.	1- 2	3/4	0	0.0
A	COMPUTER CONSOLES	15- 40	40 1/4	+4 1/2	+12.6
O	COMPUTER DEVICES INC	4- 21	13 3/8	+1 1/2	+12.8
O	COMPUTER TRANSCEIVER	4- 8	7 5/8	+1 7/8	+32.6
N	COMPUTERVISION CORP	18- 38	32 3/8	+1	+3.1
N	CONRAC CORP	31- 36	32	- 1/2	-1.7
A	DATA ACCESS SYSTEMS	2- 5	1	0	0.0
A	DATAPRODUCTS CORP	16- 36	34 1/4	- 1/4	-0.7
A	DATARAM CORP	6- 18	8 5/8	+ 1/8	+1.3
O	DATUM INC	2- 8	6 7/8	+ 3/8	+5.8
O	DAVID JAMIESON CARLYL	2- 7	4 1/8	- 1/2	-10.8
O	DECISION DATA COMPUT	3- 14	11 3/8	+ 3/4	+7.0
O	DELTA DATA SYSTEMS	1- 7	2 3/8	0	0.0
N	ELECTRONIC M & M	5- 8	8 3/4	+ 3/8	+5.0
O	EVANS & SUTHERLAND	18- 46	44	+ 1/2	+1.1
O	GANDALF TECHNOLOGIES	16- 22	18 1/8	-1	-5.7
N	GEN'L DATA COMM IND	6- 16	16	+1 1/2	+8.0
O	GENERAL TERMINAL CP	0- 4	3/4	+ 1/8	+20.0
O	GREAT SOUTHWEST IND	2- 6	3	0	0.0
N	HAZELTINE CORP	22- 43	30 1/4	- 1/8	-0.3
O	ICOT CORP	3- 8	7	- 3/8	-5.0
O	INFORMATION INTL INC	10- 22	18	- 3/4	-3.7
O	INTEL CORP	21- 43	42 3/8	+4 3/4	+12.5
O	IPL SYSTEMS INC	5- 8	6 1/8	+ 1/4	+4.1
N	LUNDY ELECTRONICS	7- 14	12 3/4	+ 7/8	+7.3
A	MAI DATA CORP	14- 38	35 1/2	+6 1/2	+22.4
O	NETWORK SYSTEMS CORP	17- 42	38 3/8	+4 3/8	+12.3
O	ONEX	3- 8	3	0	0.0
N	PARADYNE CORP	24- 50	40 3/8	+2 1/2	+6.6
N	PENRIL CORP	7- 13	10	+ 1/8	+1.3
O	RAMTEK CORP	12- 20	17 3/4	+2 1/8	+14.7
A	RECOGNITION EQUIP	4- 11	11 3/8	+2 1/8	+24.8
O	SCAN DATA	1- 5	1 1/4	0	0.0
N	STORAGE TECHNOLOGY	18- 44	23 3/4	+2 3/8	+11.1
O	SYKES DATATRONICS	6- 34	11 3/4	+ 3/8	+3.3
O	T BAR INC	7- 11	8 3/4	+ 3/8	+4.8
A	TEC INC	4- 12	8 1/4	- 3/8	-3.0
N	TEKTRONIX INC	38- 63	62 1/2	+3 3/4	+6.4
N	TELEX	5- 27	22 3/4	+1	+4.5
O	TESDATA SYSTEMS CP	3- 10	7 1/4	+ 7/8	+13.7
A	TIMEPLEX INC	7- 22	22 1/4	+4	+21.0
O	VISUAL TECHNOLOGY	5- 17	16 3/4	+ 1/2	+3.2
O	WILTEK INC	1- 3	1 7/8	0	0.0
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	11- 18	18 3/8	+1 1/2	+8.8
O	BALTIMORE BUS FORMS	1- 2	1 1/4	0	0.4
N	BARRY WRIGHT	13- 22	20 1/4	+1	+5.1
O	CYBERMATICS INC	1- 1	7/8	0	0.0
A	DUPLEX PRODUCTS INC	12- 20	18 3/8	+1 3/8	+8.0
N	ENNIS BUS. FORMS	18- 30	29	-1	-3.3
N	3M COMPANY	48- 78	78 5/8	+5 5/8	+7.7
N	MOORE CORP LTD	26- 44	43 3/8	+3 3/8	+8.4
N	NASHUA CORP	8- 18	11 1/8	+ 1/2	+4.7
O	STANDARD REGISTER	32- 72	64	-2 1/2	-3.8
N	TAB PRODUCTS CO	12- 29	29 5/8	+3 3/4	+14.5
N	WALLACE BUS FORMS	22- 38	37 1/2	+1 1/8	+2.7

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